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1971-72

The
Graduate
School

Indiana
University of
Pennsylvania

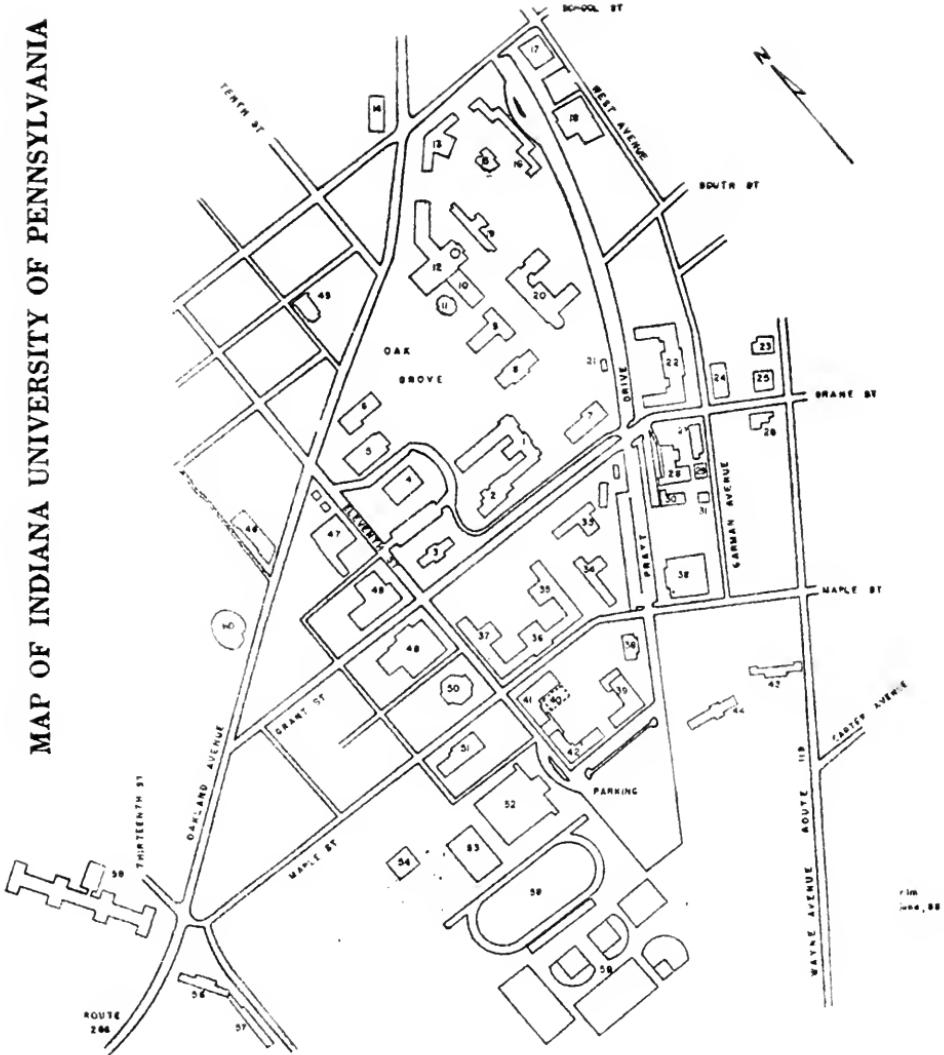


1972

RHODES R. STABLEY LIBRARY
INDIANA UNIVERSITY OF PENNSYLVANIA

KEY TO BUILDINGS

1. John Sutton Hall
2. Thomas Sutton Hall
3. Clark Hall
4. Stobley Library
5. Fisher Auditorium
6. Waller Hall
7. Ackerman Hall
8. McElhaney Hall
9. Leonard Hall
10. Walsh Hall
11. Wilson Hall
12. Weyondi Hall
13. Elkin Hall
14. Leininger Hall
15. Elkin House
16. Whitmyre Hall
17. Student Affairs Building
18. Student Union
19. Gordon Hall
20. Keith Hall
21. Flagstone Theater
22. Women's Dorm (proposed)
23. Algonquin Hall
24. Canastota Hall
25. Stone Manor
26. Grant Hall
27. Maintenance Building
28. Boiler Plant
29. Marin Range
30. Shop Building
31. Maintenance Garage
32. Dining Hall (proposed)
33. Wahl Hall
34. Longham Hall
35. Turnbull Hall
36. Stewart Hall
37. Mack Hall
38. Health Services Building
39. Men's Dormitory
40. Area Emer. Op. Center
41. Men's Dormitory
42. Men's Dormitory
43. Leroy Hall
44. McGregor Hall
45. Uhler Hall
46. Wyoming Hall
47. Cossatot Hall
48. Classroom Hall (proposed)
49. Foster Dining Hall
50. Learning Research Center
51. Military Hall
52. Memorial Field House
53. Tennis Courts
54. Lecture Building
55. Carriage House
56. Oakland Hall
57. Rooney Hall
58. Miller Stadium
59. Athletic Fields
60. Newman Center

MAP OF INDIANA UNIVERSITY OF PENNSYLVANIA

The Graduate School

BULLETIN

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INDIANA UNIVERSITY OF PENNSYLVANIA
INDIANA, PENNSYLVANIA

Graduate Catalog 1971 - 1972



THIS UNIVERSITY IS ACCREDITED BY THE NATIONAL COUNCIL FOR ACCREDITATION OF TEACHER EDUCATION FOR THE PREPARATION OF ELEMENTARY AND SECONDARY TEACHERS AND TEACHERS IN THE SPECIAL FIELDS OF ART, BUSINESS, HOME ECONOMICS, MUSIC, DRIVER AND SAFETY EDUCATION, DENTAL HYGIENISTS, AND PUBLIC SCHOOL NURSES, AND BY THE MIDDLE STATES ASSOCIATION OF COLLEGES AND SECONDARY SCHOOLS. THE UNIVERSITY IS A MEMBER OF THE COUNCIL OF GRADUATE SCHOOLS IN THE UNITED STATES.

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CALENDAR**Spring Semester, 1971**

December 1—Students who plan to take graduate work during the spring semester must have an application for graduate study approved on or before this date.

December 15—Tentative class programs for spring semester must be submitted by this date.

January 20—Payment of fees for all graduate students in spring semester must be completed by this date.

January 26—Spring semester evening classes begin.

January 30—Spring semester Saturday classes begin.

March 2—Prospective May graduates must have an application for graduation approved on or before this date.

March 25—Easter vacation begins.

April 1—Final draft of research project or thesis due for May graduates.

April 11—Easter vacation ends.

May 15—Classes terminate.

May 23—Commencement.

May 23—Semester ends.

Pre-Session, 1971

May 1—Students who plan to take graduate work during pre-session must have an application for graduate study approved on or before this date.

May 15—Tentative class programs for pre-session must be submitted by this date.

June 2—Prospective August graduates must have an application for graduation approved on or before this date.

June 3—Payment of fees for all graduate students in pre-session must be completed on or before this date.

June 10—Pre-session classes begin.

June 23—Pre-session classes terminate.

Main Session, 1971

June 2—Students who plan to take graduate work during main session must have an application for graduate study approved on or before this date.

June 16—Tentative class programs for main session must be submitted by this date.

June	20—Payment of fees for all graduate students in main session must be completed on or before this date.
June	30—Final draft of research project or thesis due for August graduates.
June	29—Main session classes begin.
August	6—Main session classes terminate.

Post-Session, 1971

July	15—Students who plan to take graduate work during post-session must have an application for graduate study approved on or before this date.
July	21—Tentative class programs for post-session must be submitted by this date.
August	3—Payment of fees for all graduate students in post-session must be completed by this date.
August	9—Post-session classes begin.
August	20—Post-session classes terminate.
August	22—Summer Commencement.

Fall Semester, 1971-1972

August	1—Students who plan to take graduate work during the fall semester must have an application for graduate study approved on or before this date.
August	15—Tentative class programs for fall semester must be submitted by this date.
September	2—Payment of fees for all graduate students in fall semester must be completed by this date.
September	7—Fall semester evening classes begin.
September	11—Fall semester Saturday classes begin.
October	1—Prospective January graduates must have filed an application for graduation on or before this date.
November	23—Thanksgiving vacation begins.
November	30—Thanksgiving vacation ends.
December	1—Final draft of research project or thesis due for January graduates.
December	18—Christmas vacation begins.
January	3—Christmas vacation ends.
January	9—Winter Commencement.
January	15—Semester ends.

Spring Semester, 1972

December 1—Students who plan to take graduate work during the spring semester must have an application for graduate study approved on or before this date.

December 15—Tentative class programs for spring semester must be submitted by this date.

January 20—Payment of fees for all graduate students in spring semester must be completed by this date.

January 25—Spring semester evening classes begin.

January 29—Spring semester Saturday classes begin.

March 2—Prospective May graduates must have filed an application for graduation on or before this date.

April 1—Final draft of research project or thesis due for May graduates.

March 29—Easter vacation begins (at close of classes).

April 6—Easter vacation ends.

May 13—Classes terminate.

May 27—Semester ends.

May 28—Commencement.

TENTATIVE PROGRAM OF CLASSES
SPRING, 1971

TUESDAY EVENINGS

(5:30-7:10 P.M.)

Art	511	Curriculum Development, Supervision, and Administration in Art Education
Bus	503	Financial Statement Analysis
Chem	630	Organic Chemistry
CnEd	541	Supervised Experience in Counseling (El.) 4 cr.
CnEd	550	Supervision of Guidance Workers (El.) 4 cr.
Econ	553	Contemporary Economic Issues
Ed	513	Social Foundations of Education
EdPsy	551	Advanced Clinical Practicum
EdPsy	561	Seminar in Inter-Disciplinary Coordination and Communication
Eng	557	Modern American Poetry
Hist	501	Historiography
LRes	543	Slide and Filmstrip Production for Education
Math	544	Vector Analysis II
Math	572	Modern Geometry II
Phys	642	Advanced Mechanics II
PolS	574	Political Science Seminar
Psy	536	Psychology of Learning
SS	514	Research Methodologies in Social Science
SpE	560	Selected Problems and Research
SpH	550	Speech Science

TUESDAY EVENINGS

(7:30-9:10 P.M.)

Art	523	Seminar in Art Criticism
Bio	586	Taxonomy and Ecology of Bacteria
Bus	502	Advanced Tax Accounting
CnEd	537	Interview and Consultative Techniques
Ed	512	Philosophical Foundations of Education
EdPsy	550	Clinical Practicum
EdPsy	565	Seminar in Problems of School Psychologists
ElSc	551	Physics II
Eng	529	Romantic Poets
Geog	593	Geographic Research II
Geol	534	Geomorphology
Grad	515	Elements of Research
Hist	512	Readings in History
Hist	522	Seminar
LRes	548	Writing for Radio and Television
Math	534	Complex Variables II
Math	590	Mathematics Research
Phil	583	American Philosophic Thought
Phys	651	Advanced Electromagnetic Theory I
Soc	565	Adolescence in American Society

WEDNESDAY EVENINGS

(5:30-7:10 P.M.)

Art	522	Art in America
Chem	610	Inorganic Chemistry
CnEd	534	Evaluative Methods in Guidance II
CnEd	543	Planning Principles

CnEd	545	Human Relations and Communications
Ed	512	Philosophical Foundations of Education
EdPsy	511	Introduction to Educational Specialists
El	545	Experimental Studies in Art Education
ElMath	504	Foundations of Algebra II
Eng	510	Bibliographical Methods
Eng	530	Tennyson and Browning
Hist	544	Seminar
HE	574	Home Economics in Higher Education
Math	585	Mathematical Statistics II
Mus	513	Advanced Band Scoring
Phys	662	Quantum Mechanics III
PolS	572	Corporative Political Studies
Psy	534	Abnormal Psychology

WEDNESDAY EVENINGS
(7:30-9:10 P.M.)

Anth	593	The Science of Culture
Bio	553	Principles of Animal Taxonomy
CnEd	539	Group Procedures in Guidance
CnEd	544	Organizing Principles (1 cr.)
CnEd	551	Evaluation of Guidance Services (1 cr.)
EdPsy	560	Human Relations and Communications in Education
ElSc	580	Astronomy
Eng	522	Chaucer
Geog	590	Map and Photo Interpretation
Hist	531	Economic and Social History of Pennsylvania
HE	572	Evaluation in Home Economics Education
Math	532	Advanced Calculus II
Math	574	Topology II
Mus	533	Comparative Choral Methods
Phil	581	Problems in Logic
Phys	565	Modern Physics

THURSDAY EVENINGS
(5:30-7:10 P.M.)

Art	525	Architectural Influences in a Contemporary Society
Bio	612	Biology Seminar
Chem	652	Enzymes
CnEd	535	Study of the Individual
CnEd	541	Supervised Experience in Counseling (Sec.) 4 cr.
CnEd	550	Supervision of Guidance Workers (Sec.) 4 cr.
EdPsy	532	Studies in Pupil Adjustment
El	511	The Teaching of Reading in the Elementary School
El	543	Curriculum Resources in Elementary Science
ElSc	551	Physics II
Eng	537	Modern American Fiction
Grad	516	Statistical Methods I
Hist	532	U.S. - British Commonwealth Relations
Hist	543	Modern Asian - African Problems
HE	530	Seminar in Clothing and Textiles
LRes	502	Programmed Learning in Education
Math	502	Digital Computers and Compiler Systems
Mus	506	Music Literature of the late Roman Era
Phys	503	Theoretical Physics II

THURSDAY EVENINGS
(7:30-9:10 P.M.)

Art	528	World Art Since 1875
Bus	534	Consumer Economic Problems
CnEd	542	School Services
Ed	513	Social Foundations of Education
EdPsy	501	Seminar in Special Topics in Educational Psychology
El	501	Classroom Diagnosis and Remediation of Reading Disabilities
ElMath	520	Seminar in Elementary School Mathematics
Eng	528	Milton
Geog	528	South America (Seminar)
Hist	542	Contemporary Latin American Problems
LRes	530	Classification and Cataloging of Learning Resources
Math	564	Linear Algebra II
Phys	533	Heat and Thermodynamics

SATURDAY MORNINGS
(9:00-10:40 A.M.)

Art	544	Graduate Studio in Fabrics I
Art	545	Graduate Studio in Fabrics II
Art	546	Graduate Studio in Fabrics III
Bio	554	Advanced Ornithology
Bus	560	Improvement of Instruction in Secretarial Courses
CnEd	531	Philosophy and Principles of Guidance
CnEd	536	Information Service in Guidance
CnEd	546	Encounter and Sensitivity Training in Counseling
ElMath	542	Arithmetic in Elementary School
Eng	512	American English Grammar
Eng	555	Realism in American Fiction
Geog	553	Political Geography
GeoS	571	Oceanography II
Grad	515	Elements of Research (CnEd majors)
Hist	521	Seminar
HE	523	Field Work in Family Life and Human Development
HE	576	Home Economics Education Research Colloquium
Math	562	Abstract Algebra II
Psy	530	Psychology of Growth and Development
Span	521	Seminar on Cervantes
SpH	532	Adult Aphasia

SATURDAY MORNINGS
(11:00 A.M.-12:40 P.M.)

Art	565	Graduate Studio in Water Color Painting I
Art	566	Graduate Studio in Water Color Painting II
Art	567	Graduate Studio in Water Color Painting III
Bus	541	Principles of Management
CnEd	538	Management of the Guidance Services
ElSc	570	Geology
Eng	531A	Hawthorne and Thoreau
Eng	539	Metaphysical Poets
HE	574	Seminar in Home Economics Education
HE	577	Independent Study in Home Economics Education
Math	530	Differential Equations II
Math	580	Logic
Span	522	Seminar on Perez Galdos
SpE	522	Orientation to Rehabilitation

DAYTIME CLASSES

Bio	576	Radiation Biology	M. W. 8:00 F. 8:00-11:00
Chem	600	Seminar	F. 4:00
Chem	621	Electroanalytical Chemistry	M. W. 12:00 F. 8:00-12:00
Chem	690	Research	To be arranged
Econ	552	Comparative Economic Systems	T. Th. 1:30
Econ	555	Labor and Industrial Relations	M. W. F. 9:00 T. Th. 3:00-4:15
Econ	556	History of Economic Thought	T. Th. 9:30 M. W. F. 11:00
Ed	513	Social Foundations of Education	W. 1:30-3:10
El	544	Recent Trends in Elementary Language Arts	M. W. 2:00
El	550	The Community and the Elementary School	T. 1:00-3:00
Geog	517	General City and Regional Planning	M. W. F. 12:00
Geog	519	Urban Planning Basic Studies and Analysis	W. 1:00-5:00
Geog	550	Readings in Geography	To be arranged
Geog	561	Urban Plan Implementation	T. Th. 1:00-3:00
Geog	589	Cartography	T. Th. 3:00-5:00
Geog	591	Geographic Thought	T. Th. 5:00-6:15
Hist	553	History of England Since 1688 (3 cr.)	M. W. F. 9:00
Hist	555	History of Soviet Russia (3 cr.)	M. W. F. 10:00
Hist	591	Social and Intellectual History of U.S. since 1876 (3 cr.)	M. W. F. 11:00
Math	532	Advanced Calculus II	M. W. F. 9:00
Math	562	Abstract Algebra II	M. W. F. 1:00
Math	576	Projective Geometry II	M. W. F. 2:00
Math	584	Mathematical Statistics I	M. W. F. 1:00
PolS	575	American Political Parties	M. W. F. 2:00
PolS	576	Legislative Process	M. W. F. 10:00
PolS	577	Metropolitan Problems	M. W. 4:00-5:15
PolS	580	Public Opinion	M. W. F. 3:00
PolS	581	The Presidency	M. W. F. 9:00

**Tentative Schedule of Classes for
Pre-Summer Session, 1971**

		Period
Art	526	1
Art	543	2
Art	550	2
Art	551	2
Art	552	2
Bio	553	1
Bio	554	2
Bus	550	1
Chem	500	1
CnEd	531	2
CnEd	533	2
CnEd	537	1
CnEd	538	1
Econ	553	1
Econ	554	2
Ed	511	1
Ed	512	2
Ed	513	1
EdPsy	511	1
EdPsy	521	1
	Disabilities for Educational Specialists	1
EdPsy	550	1
EdPsy	576	1
El	500	2
El	511	2
El	531	1
El	541	1
ElMath	501	2
ElMath	506	1
ElSc	530	2
ElSc	588	1
Eng	539	1
Eng	557	1
Eng	579	2
Eng	582	1
Eng	586	1
Eng	589	2
Eng	592	2
Geog	521	1
Geog	522	2
Geog	589	1
Geog	592	2
Grad	550	2
Hist	501	2
Hist	512	2
Hist	531	1
Hist	541	1
Hist	552	2
HE	521	2
HE	574	1
HE	599	1
LRes	501	1
LRes	506	2
Math	511	2

Math	521	Basic Concepts in Mathematics	1
Math	600	Methods of Research in Mathematics	1
Mus	502	Advanced Instrumental Conducting	1
Mus	529	String Pedagogy	2
Mus	533	Comparative Choral Methods	1
Phil	580	Studies in Religious Thought	2
Phil	582	Problems of Ethics	1
Phys	533	Heat and Thermodynamics	2
Phys	541	Analytical Mechanics I	2
PolS	571	Foreign Policy Studies	1
PolS	575	American Political Parties (3 cr.-3 wks.)	2
PolS	581	The Presidency (3 cr.-3 wks.)	2
Psy	530	Psychology of Growth and Development	1
Psy	531	Psychology of Exceptional Children and Youth	1
Psy	533	Psychology of Personality	2
Psy	534	Abnormal Psychology	2
Psy	540	Advanced Mental Hygiene	1
Sci	572	Experimental Techniques in Chemistry and Physics	1
Soc	562	Deviant Behavior	2
SS	514	Research Methodologies in the Social Sciences	1
SS	521	Contemporary American Issues (non-majors)	2
SpH	512	Cleft Palate	1
SpH	663	Advanced Clinical Practicum II	1

**Tentative Schedule of Classes for
Main Summer Session, 1971**

			Period
Anth	592	Comparative Cultures	3
Art	510	Art and the Exceptional Child	1
Art	513	Research and Philosophy in Art Education	1
Art	521	Contemporary Movements in Art	2
Art	522	Art in America	2
Art	527	Renaissance Art	1
Art	540	Graduate Studio in Ceramics I	3
Art	541	Graduate Studio in Ceramics II	3
Art	542	Graduate Studio in Ceramics III	3
Art	547	Graduate Studio in Jewelry and Metal Work I	2
Art	548	Graduate Studio in Jewelry and Metal Work II	2
Art	549	Graduate Studio in Jewelry and Metal Work III	2
Art	562	Graduate Studio in Oil Painting I	3
Art	563	Graduate Studio in Oil Painting II	3
Art	564	Graduate Studio in Oil Painting III	3
Art	568	Graduate Studio in Print Making I	4
Art	569	Graduate Studio in Print Making II	4
Art	570	Graduate Studio in Print Making III	4
Bio	536	Comparative Plant Morphology	1
Bio	556	Animal Ecology	2
Bio	560	Herpetology	4
Bio	611	Seminar I	1
Bio	612	Seminar II	3
Bus	501	Principles of Taxes	2
Bus	503	Financial Statement Analysis	1
Bus	504	Budget Cost Analysis	3
Bus	510	Business Communications and Report Writing	3
Bus	512	Office Organization and Management	1
Bus	522	Sales Promotion and Advertising	1
Bus	532	Current Business Economic Problems	2
Bus	537	Automated Data Processing II (4 cr. with a 3 hr. lab.)	3

Bus	541	Principles of Management	2
Bus	543	Leadership Development in Business and Distributive Education	4
Bus	552	Seminar in Business Education	2
Bus	553	Supervision of Business Vocational Education	4
Bus	563	Improvement of Instruction in Office Practice	4
Chem	610	Inorganic Chemistry	1
Chem	620	Analytical Chemistry	2
CnEd	533	Evaluative Methods in Guidance I	1
CnEd	534	Evaluative Methods in Guidance II	3
CnEd	536	The Information Service in Guidance	4
CnEd	541	Supervised Experience in Counseling (4 cr.) (Sec.)	1 & 2
CnEd	541	Supervised Experience in Counseling (4 cr.) (Elem.)	3 & 4
CnEd	542	School Services	1
CnEd	543	Planning Principles	3
CnEd	544	Organizing Principles (1 cr.-3 wks.)	2
CnEd	546	Encounter and Sensitivity in Counseling	3
CnEd	550	Supervision of Guidance Workers (4 cr.) (Sec.)	1 & 2
CnEd	550	Supervision of Guidance Workers (4 cr.) (Elem.)	3 & 4
CnEd	551	Evaluation of Guidance Services (1 cr.-3 wks.)	2
Econ	501	Foundations of Modern Economics	1
Econ	525	Monetary Economics	2
Econ	555	Industrial and Labor Relations	3
Ed	511	Historical Foundations of Education	1 & 3
Ed	512	Philosophical Foundations of Education	2 & 4
Ed	513	Social Foundations of Education	1-2-3 & 4
Ed	522	Principles and Practices in Speech Improvement	2
EdPsy	502	Advanced Educational Psychology	3
EdPsy	518	Interpretation of Psychological Tests for Reading Specialists	3
EdPsy	532	Studies in Pupil Adjustment	1
EdPsy	550	Clinical Practicum (permit to enter required) (by appointment)	4
EdPsy	560	Human Relations and Communications in Education (permit to enter required)	3
EdPsy	573	Advanced Psychology of Adolescent Education	2
El	500	Basic Foundations of Reading Instruction	2
El	501	Diagnosis and Remediation of Reading Disabilities	4
El	502	Reading Practicum: Diagnostic Case Studies (1st 3 wks. - 2 cr.)	3 & 4
El	503	Reading Practicum: Remedial Case Studies (2nd 3 wks. - 2 cr.)	3 & 4
El	543	Resource Materials in Elementary Science	2
El	544	Recent Trends in Elementary Language Arts	4
El	547	Resource Materials in Children's Literature	1
El	548	Creativity and the Elementary School Child	4
El	549	Methods and Materials in Preschool Education	2
El	550	The Community and the Elementary School	3
El	551	Recent Innovations in Elementary Education	3
El	552	Evaluating the Elementary School	2
El	553	Supervision and Improvement of Instruction in the Elementary School	1
El	555	Advanced Human Development and Learning	1
ElMath	508	Coordinate Geometry and Trigonometry II	2
ElMath	511	Introduction to Computing Machines and Their Uses	4
ElSc	510	Education in the Out-of-doors (4 cr.)	3 & 4
ElSc	511	Education in the Out-of-doors (4 cr.)	3 & 4

ElSc	564	Zoology I	1
ElSc	565	Zoology II	2
Eng	510	Bibliographical Methods in English (Sec. 1) 2 & 4	
Eng	512	American English Grammar (3 cr.)	1
Eng	513	The English Language From the Beginnings to 1500 (3 cr.)	4
Eng	522	Chaucer (3 cr.)	2
Eng	527	Restoration and 18th Century Drama (3 cr.)	1
Eng	528	Milton (3 cr.)	3
Eng	532	Colonial American Literature (3 cr.)	2
Eng	550	Workshop in Play Production (6 cr.)	all day & evening
Eng	572	Major Writers: Thomas Hardy	3
Eng	574	Major Writers: Poe	2
Eng	583	Major Writers: Byron, Keats, and Shelley	4
Eng	587	Major Writers: W. B. Yeats	1
Eng	593	Major Writers: Fitzgerald and Lewis	2
Eng	600	Seminar in British Literature to 1500 (3 cr.)	1
Eng	630	Seminar in British Literature—Restoration and 18th Century (1660-1800) (3 cr.)	4
Eng	640	Seminar in British Literature—Nineteenth Century (to 1870) (3 cr.)	1
Eng	650	Dissertation	by app.
Eng	680	Seminar in Modern American Literature (from 1870) (3 cr.)	3
Eng	690	Seminar in Literary Criticism (3 cr.)	3
FL	521	Language and Society	3
Geog	516	Historical Geography of Cities and City Planning	2
Geog	517	General City and Regional Planning	4
Geog	534	China, Korea, and Japan	1
Geog	592	Research II	3
Geol	534	Geomorphology	2
GeoS	591	Field and Laboratory Investigations in Geoscience	4
Grad	515	Elements of Research (Elementary Ed. Majors)	1
Grad	516	Statistical Methods I	3
Grad	550	Research and Thesis	3
Hist	501	Historiography	2
Hist	511	Readings in History	3
Hist	512	Readings in History	4
Hist	521	History Seminar	4
Hist	522	History Seminar	2
Hist	546	History of Europe 1815-1914	1
Hist	553	History of England to 1688	3
Hist	554	History of Russia to 1917	4
Hist	590	Social and Intellectual History of the United States to 1875	3
HE	530	Clothing and Human Behavior	2
HE	541	Advanced foods and Gourmet Cookery	4
HE	551	Seminar in Home Management and Family Economics	3
HE	570	Home Economics in American Education	1
HE	573	Supervision and Administration in Home Economics Education	3
HE	577	Independent Study in Home Economics Education	1
HE	578	Research in Home Economics Education	4
HE	596	Oriental Study Tour in Family Life	1
LRes	500	Seminar in Learning Resources	1
LRes	530	Classification and Cataloging of Learning Resources	1

LRes	542	Preparation of Transparencies	4
LRes	549	Television Production and Direction	2
LRes	560	Management of Learning Resources Programs	3
Math	501	Fortran	1
Math	503	Seminar: Computer Applications in Research	3
Math	530	Differential Equations II	4
Math	531	Advanced Calculus I	3
Math	532	Advanced Calculus II	3
Math	533	Functions of a Complex Variable I	2
Math	535	Functions of a Real Variable I	4
Math	544	Vector Analysis II	1
Math	552	Number Theory	1
Math	561	Abstract Algebra I	2
Math	562	Abstract Algebra II	2
Math	564	Linear Algebra II	3
Math	572	Modern Geometry II	2
Math	575	Projective Geometry I	1
Math	580	Logic	1
Math	584	Mathematical Statistics I	4
Mus	507	Music Literature of the Twentieth Century	3
Mus	510	Seminar in Music Literature	4
Mus	515	Canon, Double Counterpoint, and Fugue	2
Mus	516	Analytical Techniques	1
Mus	532	Seminar in Music Education	4
Mus	535	Psychology of Music Education	2
Phil	581	Problems in Logic	3
Phil	593	American Philosophic Thought	1
Phys	551	Electricity and Magnetism I	1
Phys	561	Quantum Mechanics I	2
Phys	565	Introduction to Nuclear Physics	3
PolS	572	Comparative Political Studies	3
PolS	573	Regional Political Studies	2
PolS	576	Legislative Process (3 cr.)	4
PolS	577	Metropolitan Problems (3 cr.)	1
PolS	579	Modern Political Thought (3 cr.)	2
PolS	590	Studies in Political Science (3 cr.)	3
Psy	530	Psychology of Growth and Development	1
Psy	531	Psychology of Exceptional Children and Youth	2
Psy	533	Psychology of Personality	3
Psy	534	Abnormal Psychology	2
Psy	535	Differential Psychology	2
Psy	536	Psychology of Learning	1
Psy	539	Psychology of the Mentally Retarded	4
Psy	540	Advanced Mental Hygiene	2
Psy	565	Measurement of Interests and Personality	3
Soc	563	Intergroup Relations	1
SS	510	New Approaches to Social Science Instruction	1
SS	514	Research Methodologies in Social Sciences ...1 & 2	2
SS	521	Contemporary American Issues (non-majors)	3
Span	523	Seminar on the Generation of 1898	4
SpE	520	Curriculum and Methods	3
SpH	514	Cerebral Palsy	1
SpH	561	Advanced Clinical Practicum I .....hours arranged	
SpH	663	Advanced Clinical Practicum II .....hours arranged	

**Tentative Schedule of Classes for
Post-Summer Session, 1971**

		Period
Art	511 Curriculum Development, Supervision, and Administration in Art	2
Art	524 Art of the East	1
Art	553 Graduate Studio in Crafts I	2
Art	554 Graduate Studio in Crafts II	2
Art	555 Graduate Studio in Crafts III	2
Bio	522 Biometry	1
Bio	546 Dendrology	2
Bus	551 Administration and Supervision of Business Education	2
Bus	570 Economic Background in Business (non-business students)	2
Chem	522 Advanced Instrumental Methods of Analysis	1
CnEd	534 Evaluative Methods in Guidance II	2
CnEd	534 Case Study Techniques	1
CnEd	539 Group Procedures in Guidance	2
Econ	552 Comparative Economic Systems	1
Ed	512 Philosophical Foundations of Education	1
Ed	512 Social Foundations of Education	1
EdPsy	532 Studies in Pupil Adjustment	1
EdPsy	550 Clinical Practicum (permit to enter required) (by appointment)	1
EdPsy	562 Counseling and Psychotherapy (permit to enter required)	1
EdPsy	572 Advanced Psychology of Childhood Education	1
El	508 Reading in the Content Areas	1
El	531 Curriculum Problems in Elementary Education	1
El	541 Special Problems in Elementary Social Studies	1
El	545 Experiment Studies in Art Education	1
ElMath	554 Administration of the Elementary School	2
ElMath	502 Basic Concepts in Mathematics II	2
ElSc	542 Arithmetic in the Elementary School	1
ElSc	566 Conservation	1
Eng	570 Geology	2
Eng	571 Major Writers: Faulkner and Hemingway	1
Eng	578 Major Writers: Edmund Spenser	1
Eng	581 Major Writers: Jonathan Swift	2
Eng	585 Major Writers: Charles Dickens	1
Eng	588 Major Writers: G. B. Shaw	2
Geog	528 Middle America	2
Geog	594 Field Techniques in Geography	1
Grad	515 Elements of Research	1
Grad	517 Statistical Methods II	2
Grad	550 Research and Thesis	2
HPe	530 Community-School Health Education Workshop	all day
HE	532 Recent Developments in Textiles	1
HE	572 Evaluation in Home Economics	2
HE	599 European Study Tour in Textiles and Clothing	1
Hist	534 Recent U.S. History	1
Hist	542 Contemporary Latin American Problems	2
Hist	555 History of Soviet Russia	1
LRes	500 Seminar in Learning Resources	1
LRes	540 Preparation of Learning Resources	2
Math	510 Seminar in Mathematics I (Jr. H.S. Math)	1
Mus	534 Comparative Instrumental Methods	1
Mus	539 Vocal Workshop	2

Phys	552	Electricity and Magnetism II	2
PolS	560	Latin America (3 wks. - 3 cr.)	1
PolS	585	Political Philosophy	2
Psy	530	Psychology of Growth and Development	1
Psy	533	Psychology of Personality	2
Psy	536	Psychology of Learning	2
Psy	540	Advanced Mental Hygiene	1
Span	524	Hispanic Poetry Since 1888	2

**Tentative Program of Classes for
Fall Semester, 1971**

**TUESDAY EVENINGS
(5:30-7:10 P.M.)**

Art	513	Research and Philosophy in Art Education
Bio	611	Seminar I
Bus	531	Principles of Investments in Securities
Bus	570	Economic Background in Business (non-business students)
Chem	620	Analytical Chemistry
CnEd	541	Supervised Experience in Counseling (Elem. 5:30-9:10) 4 cr.
CnEd	550	Supervision of Guidance Workers (Elem. 5:30-9:10) 4 cr.
Ed	513	Social Foundations of Education
EdPsy	576	Advanced Studies in Behavior Problems
Eng	511	Seminar in the Teaching of English in Secondary Schools (5:20-7:00)
Eng	573	Major Writers: Whitman (5:20-7:00)
Hist	541	Modern European Problems
HE	570	Home Economics in American Education
LRes	502	Programmed Learning in Education
Math	501	Fortran
Math	582	Theory of Probability
Phys	542	Analytical Methods II
Phys	641	Advanced Mechanics I
Psy	539	Psychology of the Mentally Retarded
Psy	540	Advanced Mental Hygiene
Span	525	The Spanish Novel after the Civil War
SS	510	New Viewpoints in the Social Sciences
SS	521	Contemporary American Issues (non-majors)
SpH	530	Childhood Aphasia (5:00)
SpH	561	Advanced Clinical Practicum I (hours arranged)
SpH	663	Advanced Clinical Practicum II (hours arranged)

**TUESDAY EVENINGS
(7:30-9:10 P.M.)**

Anth	595	Pre-History
Art	525	Architectural Influences in a Contemporary Society
Bio	612	Seminar II
CnEd	537	Interview and Consultative Techniques
Ed	512	Philosophical Foundations of Education
EdPsy	532	Studies in Pupil Adjustment
ELSc	540	Chemistry I
Eng	517	Elizabethan Drama (7:10-9:40)
Eng	695	Seminar in Linguistics (7:10-9:40)
Geog	592	Research I
Geol	503	Earth Processes
Hist	511	Readings in History

HE	542	Contemporary Issues in Foods and Nutrition
LRes	515	Role of Learning Resources: Theoretical and Research Foundations
Math	503	Seminar in Complex Applications in Research
Math	561	Abstract Algebra I
Phil	582	Problems of Ethics
Phys	502	Theoretical Physics I
Phys	652	Advanced Electromagnetic Theory II
Span	530	Hispano-American Authors (Social Themes)
SpH	650	Experimental Phonetics

WEDNESDAY EVENINGS
(5:30-7:10 P.M.)

Art	528	World Art Since 1875
Bio	581	Microbial Physiology
Bus	542	Human Relations in Business
CnEd	533	Evaluative Methods in Guidance I
CnEd	543	Planning Principles
CnEd	545	Human Relations and Communications
CnEd	546	Encounter and Sensitivity in Counseling
Ed	512	Philosophical Foundations of Education
EdPsy	521	Diagnosis and Remediation of Learning Disabilities for Educational Specialists
EdPsy	550	Clinical Practicum (permit to enter required) (by appointment)
EdPsy	565	Seminar in Problems of School Psychologists (permit to enter required)
El	500	Basic Foundations of Reading Instruction
El	543	Resource Materials in Elementary Science
Eng	510	Bibliographical Methods in English (5:20-7:00)
Eng	591	Major Writers: Frost and Robinson (5:20-7:00)
Geol	507	Life of the Geologic Past
Hist	532	U.S.-British Commonwealth Relations
HE	531	Creative Clothing
Math	563	Linear Algebra I
Math	573	Topology I
Phys	661	Quantum Mechanics II
PolS	574	Political Science Seminar
Psy	530	Psychology of Growth and Development
SS	514	Research Methodologies in Social Science

WEDNESDAY EVENINGS
(7:30-9:10 P.M.)

Art	543	Exhibition Techniques
Astro	534	The Sun's Family
Bio	526	Molecular Genetics
Bus	522	Sales Promotion and Advertising
Chem	546	Biochemistry I
CnEd	542	School Services
CnEd	544	Organizing Principles (1 cr. - 3 wks.)
CnEd	551	Evaluation of Guidance
CnEd	539	Group Procedures in Guidance
Ed	513	Social Foundations of Education
EdPsy	511	Introduction to Educational Specialists
EdPsy	550	Clinical Practicum (permit to enter required) (by appointment)
El	542	Arithmetic in the Elementary School
El	547	Resource Materials in Children's Literature
ElSc	574	Meteorology
Eng	536	Middle English Ballads, Lyrics, and Romances (7:10-9:40) 3 cr.

Eng	543	The British Novel of the Eighteenth Century (7:10-9:40) 3 cr.
Geog	535	Australia (Seminar)
Hist	544	History Seminar
HE	571	Curriculum Development in Home Economics Education
Math	535	Functions of a Real Variable I
Mus	528	Contemporary International Approaches to Elementary Music Education
Phil	580	Studies in Religious Thought
Phys	504	Theoretical Physics II
Soc	564	Sociology Seminar

THURSDAY EVENINGS
(5:30-7:10 P.M.)

Art	526	Exotic Art
Bio	545	Microtechniques
Chem	630	Organic Chemistry
CnEd	535	Case Study Techniques
CnEd	541	Supervised Experience in Counseling (4 cr.) (Sec. 5:30-9:10)
CnEd	550	Supervision of Guidance Workers (4 cr.) (Sec. 5:30-9:10)
EdPsy	506	Advanced Educational Tests and Measurements
EdPsy	551	Advanced Clinical Practicum (Permit to enter required) (by appointment)
El	544	Recent Trends in Elementary Language Arts
Eng	565	The Faust Literature (5:20-7:00)
Geol	505	Earth Materials
Grad	516	Statistical Methods I
Hist	543	Modern Asian African Problems
LRes	544	Beginning Cinematography for Education
Math	575	Projective Geometry I
Mus	501	Advanced Choral Conducting
Phys	512	Curriculum Development in Secondary School Physics
Phys	634	Statistical Mechanics
Psy	543	Introduction to Projective Techniques
SpE	520	Curriculum and Methods

THURSDAY EVENINGS
(7:30-9:10 P.M.)

Art	521	Contemporary Movements in Art
Bio	575	Mammalogy
Ed	513	Social Foundations of Education
EdPsy	532	Studies in Pupil Adjustment
El	511	The Teaching of Reading in the Secondary Schools
ELMath	503	Foundations of Algebra I
Eng	513	The English Language From the Beginnings to 1500 (7:10-9:40) (3 cr.)
Eng	547	Romantic Prose and Poetry (7:10-9:40)
Geog	523	Urban (Marketing)
Hist	521	History Seminar
LRes	507	Seminar in Current Problems in Broadcasting
Math	530	Differential Equations II

SATURDAY MORNINGS
(9:00-10:40 A.M.)

Art	550	Graduate Studio in Sculpture I
Art	551	Graduate Studio in Sculpture II

Art	552	Graduate Studio in Sculpture III
Bio	563	Plant Physiology
Bus	514	Executive Secretarial Training
CnEd	531	Philosophy and Principles of Guidance
CnEd	536	The Information Service in Guidance
Econ	551	International Economics
ElMath	513	Calculus I
ElSc	540	Chemistry I
Eng	510	Bibliographical Methods in English (9:10-10:40)
Eng	532	Colonial American Literature (9:00-11:30) (3 cr.)
Eng	556	Modern British Poetry (9:00-10:40)
Eng	600	Seminar in British Literature to 1500 (9:00-11:30) (3 cr.)
Geog	552	World Resources (Seminar)
Geol	505	Earth Deformation
Grad	515	Elements of Research (Counseling Ed. Majors)
Hist	590	Social and Intellectual History of U.S. to 1875
HE	577	Independent Study in Home Economics Education
Math	531	Advanced Calculus I
Math	600	Methods of Research in Mathematics
SpE	565	Education of Children With Social and Emotional Maladjustments

SATURDAY MORNINGS
(11:00 A.M.-12:40 P.M.)

Art	561	Graduate Studio in Drawing I
Art	562	Graduate Studio in Drawing II
Art	563	Graduate Studio in Drawing III
Bus	552	Seminar in Business Education
CnEd	538	Management of the Guidance Services
Ed	511	Historical Foundations of Education
Eng	584	Major Writers: Tennyson and Browning
FL	521	Language and Society
Hist	501	Historiography
Math	539	Infinite Series I
Math	580	Logic

DAYTIME CLASSES

Chem	500	Special Studies	To be arranged
Chem	600	Seminar	F. 4:00
Chem	622	Spectrochemical Methods of Analysis	T. Th. 11:00, F. 8:00-12:00
Econ	525	Monetary Economics	T. Th. 9:30-10:45
Econ	552	Comparative Economic Systems	T. Th. 3:00-4:15
Econ	554	Seminar. Special Studies in Economics	T. Th. 12:00-1:15
Econ	555	Industrial and Labor Relations	M. W. F. 10:00-11:00
Econ	556	History of Economic Thought	T. Th. 9:30-10:45
El	531	Curriculum Problems in Elementary Education	M. W. 2:00
Eng	620	Seminar in Shakespeare (3 cr.)	M. 3:00-5:30
Eng	650	Dissertation	By Appointment
Eng	660	Seminar in Modern British Literature (from 1870) (3 cr.)	S. 12:00-2:30
Eng	680	Seminar in Modern American Literature (from 1870) (3 cr.)	S. 12:00-2:30
Geog	516	Historical Geography of Cities and City Planning	M. W. F. 12:00
Geog	518	Urban Design	M. W. 3:00-5:00
Geog	589	Cartography for Thesis Writing	T. Th. 3:00-5:00

Geog	591	Geography Thought and Philosophy	T. Th. 5:00-6:15
Geog	593	Research II (Individual)	To be arranged
Grad	550	Research and Thesis	To be arranged
Hist	552	History of England to 1688	M. W. F. 10:00
Hist	554	History of Russia to 1917	M. W. F. 11:00
Mus	500	Music Literature of the 16th Century	T. Th. S. 9:00
Mus	508	Bibliography of Music	M. W. F. 1:00
Phys	522	Advanced Laboratory Practices II	T. Th. 9:00-12:00
Phys	531	Atomic Structure	M. W. F. 2:00
Phys	535	Electronics	M. W. F. 11:00 plus Lab.
Phys	542	Analytical Mechanics II	M. W. 1:00
Phys	552	Electricity and Magnetism II	M. W. F. 10:00
Phys	561	Quantum Mechanics I	M. W. F. 9:00
PolS	561	Africa (3 cr.)	M. W. F. 9:00
PolS	575	American Political Parties— Sec. 1 (3 cr.)	M. W. F. 10:00
PolS	575	American Political Parties— Sec. 2 (3 cr.)	M. W. F. 11:00
PolS	577	Metropolitan Problems—Sec. 1 (3 cr.)	M. W. F. 12:00
PolS	577	Metropolitan Problems—Sec. 2 (3 cr.)	M. W. F. 1:00
PolS	578	American Constitutional Law— Sec. 1 (3 cr.)	T. Th. 9:30-10:45
PolS	578	American Constitutional Law— Sec. 2 (3 cr.)	T. Th. 1:30-2:45
PolS	581	The Presidency—Sec. 1 (3 cr.)	M. W. F. 2:00
PolS	581	The Presidency—Sec. 2 (3 cr.)	M. W. F. 3:00
PolS	585	Political Philosophy (3 cr.)	T. Th. 8:00-9:15
PolS	591	Studies in Political Science (3 cr.)	T. Th. 3:00-4:15
PolS	599	Political Science Internship (1-6 cr.)	To be arranged

**Tentative Schedule of Classes for
Spring Semester, 1972**

**TUESDAY EVENINGS
(5:30-7:10 P.M.)**

Art	511	Curriculum Development, Supervision, and Administration in Art	
Bio	611	Seminar I	
Chem	610	Inorganic Chemistry	
CnEd	541	Supervised Experience in Counseling (Elem. 5:30-9:10) (4 cr.)	
CnEd	550	Supervision of Guidance Workers (Elem. 5:30-9:10) (4 cr.)	
Ed	513	Social Foundations of Education	
EdPsy	501	Seminar in Special Topics in Educational Psychology	
Eng	575	Major Writers: Henry James (5:20-7:00)	
Eng	590	Major Writers: Mark Twain (5:20-7:00)	
Hist	501	Historiography	
Hist	534	Recent United States History	
HE	572	Evaluation in Home Economics	
LRes	541	Photographic Fundamentals for Educational Materials	
Math	502	Digital Computers and Compiler Systems	
Math	521	Basic Concepts in Mathematics	
Math	584	Mathematical Statistics I	
Phvs	503	Theoretical Physics II	
Phys	642	Advanced Mechanics II	
Psy	530	Psychology of Growth and Development	
SpE	560	Selected Problems and Research	
SpH	518	Voice (5:00)	
SpH	561	Advanced Clinical Practicum I (to be arranged)	
SpH	563	Advanced Clinical Practicum II (to be arranged)	

TUESDAY EVENINGS
(7:30-9:10 P.M.)

Art	522	Art in America
Bio	530	Instrumentation
CnEd	531	Interview and Consultative Techniques
Ed	512	Philosophical Foundations of Education
EdPsy	532	Studies in Pupil Adjustment
ElSc	541	Chemistry II
Eng	521	Modern European Fiction (7:10-9:40) (3 cr.)
Eng	522	Chaucer (7:10-9:40) (3 cr.)
Eng	670	Seminar in American Literature to 1870 (7:10-9:30) (3 cr.)
Geog	528	South America (Seminar)
Geol	504	Earth History
Hist	531	Economic and Social History of Pennsylvania
Hist	591	Social and Intellectual History of the U.S. to 1875
LRes	548	Writing for Radio and Television
Math	507	Numerical Analysis
Math	552	Number Theory
Phil	581	Problems of Logic
Phys	521	Advanced Laboratory Practices I
PolS	573	Regional Political Studies
SpH	516	Stuttering (7:00 p.m.)

WEDNESDAY EVENINGS
(5:30-7:10 P.M.)

Anth	594	Anthropology Seminar
Art	523	Seminar in Art Education
Bio	612	Seminar II
Bus	534	Consumer Economic Problems
CnEd	534	Evaluative Methods in Guidance I
CnEd	543	Planning Principles
CnEd	545	Human Relations and Communications
CnEd	546	Encounter and Sensitivity in Counseling
Ed	513	Social Foundations of Education
EdPsy	550	Clinical Practicum (permit to register required) (by appointment)
EdPsy	561	Seminar in Inter-disciplinary Coordination and Communication (permit to enter required)
EdPsy	572	Advanced Psychology of Childhood Education
ElMath	507	Coordinate Geometry and Trigonometry I
ElSc	570	Geology
Eng	582	Major Writers: Wordsworth and Coleridge (5:20-7:00)
Geol	508	Glacial Geology
HE	578	Research Methods in Home Economics Education
Hist	521	History Seminar
Math	564	Linear Algebra II
Math	574	Topology II
Mus	535	Psychology of Music Education
Phys	662	Quantum Mechanics II
Psy	536	Psychology of Learning

WEDNESDAY EVENINGS
(7:30-9:10 P.M.)

Art	527	Renaissance Art
Astro	536	The Sidereal Universe
Bio	562	Animal Physiology
Bus	510	Business Communications and Report Writing
Chem	547	Biochemistry II
CnEd	539	Group Procedures in Guidance

CnEd	542	School Services
CnEd	544	Organizing Principles (1 cr. - 3 wks.)
CnEd	551	Evaluation of Guidance Services (1 cr. - 3 wks.)
EdPsy	502	Advanced Educational Psychology
EdPsy	550	Clinical Practicum (permit to enter required) (by appointment)
EdPsy	560	Human Relations and Communications in Education (permit to enter required)
EdPsy	565	Seminar in Problems of School Psychologists (permit to enter required)
Eng	514	The English Language Since 1500 (7:10-9:40) (3 cr.)
Eng	537	Modern American Fiction (7:10-9:40) (3 cr.)
Eng	610	Seminar in British Literature--Renaissance (7:10-9:40) (3 cr.)
Geog	512	Settlement Geography
Math	536	Functions of a Real Variable II
Math	600	Methods of Research in Mathematics
Mus	532	Seminar in Music Education
Phil	583	American Philosophic Thought
Phys	505	Theoretical Physics IV
SS	514	Research Methodologies in Social Sciences

THURSDAY EVENINGS
(5:30-7:10 P.M.)

Art	553	Graduate Studio in Crafts I
Art	554	Graduate Studio in Crafts II
Art	555	Graduate Studio in Crafts III
Bio	562	Animal Physiology
Bus	541	Principles of Management
Chem	640	Physical Chemistry
CnEd	535	Case Study Techniques
CnEd	541	Supervised Experience in Counseling (Sec. 5:30-9:10) (4 cr.)
CnEd	550	Supervision of Guidance Workers (Sec. 5:30-9:10) (4 cr.)
Ed	511	Historical Foundations of Education
EdPsy	550	Clinical Practicum (permit to enter required) (by appointment)
EdPsy	573	Advanced Psychology of Adolescent Education
El	501	Diagnosis and Remediation of Reading Disabilities
Eng	576	Major Writers: Joseph Conrad (5:20-7:00)
Hist	512	Readings in History
LRes	560	Management of Learning Resources Programs
Math	562	Abstract Algebra II
Math	576	Projective Geometry II
Mus	515	Canon, Double Counterpoint and Fugue
Phys	651	Advanced Electromagnetic Theory I
Phys	511	Secondary School Physics Laboratory Practices

THURSDAY EVENINGS
(7:30-9:10 P.M.)

Bio	540	Protozoology
Bus	513	Foundations of Teaching Business Skills
Ed	512	Philosophical Foundations of Education
EdPsy	532	Studies in Pupil Adjustment
El	508	Reading in the Content Areas
El	545	Experiment Studies in Art Education
Eng	529	Milton (7:10-9:40) (3 cr.)
Eng	544	The Psychology of Language (7:10-9:40) (3 cr.)
Geog	541	Agricultural Geography (Seminar)

Hist	546	History of Europe, 1815-1914
LRes	530	Classification and Cataloging of Learning Resources
Math	565	Theory of Groups
Math	563	Abstract Algebra I
PolS	574	Political Science Seminar

SATURDAY MORNINGS

(9:00-10:40 A.M.)

Art	540	Graduate Studio in Ceramics I
Art	541	Graduate Studio in Ceramics II
Art	542	Graduate Studio in Ceramics III
Bio	558	Endocrinology
Bus	523	Marketing Research
CnEd	531	Philosophy and Principles of Guidance
CnEd	536	The Information Service in Guidance
ElSc	541	Chemistry II
Eng	510	Bibliographical Methods in English
Eng	520	Old English Literature (3 cr.) (9:00-11:30)
Eng	527	Restoration and 18th Century Literature (3 cr.) (9:00-11:30)
Geog	550	Reading (Quantification)
Grad	515	Elements of Research (Counselor Education Majors)
Grad	516	Statistical Methods I
Hist	522	History Seminar
HE	522	Seminar in Human Development
HE	577	Independent Study in Home Economics Education
Math	540	Infinite Series II
Psy	533	Psychology of Personality
Soc	565	Adolescent in American Society
Span	510	History of the Spanish Language
SpE	522	Orientation to Rehabilitation
SpH	540	Advanced Audiology

SATURDAY MORNINGS

(11:00 A.M.-12:40 P.M.)

Art	544	Graduate Studio in Fabrics I
Art	545	Graduate Studio in Fabrics II
Art	546	Graduate Studio in Fabrics III
Bio	582	Pathogenic Bacteria
CnEd	538	Management of the Guidance Services
Ed	513	Social Foundations of Education
ElMath	514	Calculus II
Eng	577	Major Writers: Emerson
HE	541	Advanced Foods and Gourmet Cookery
Hist	542	Contemporary Latin American Problems
Math	532	Advanced Calculus II
Span	511	Stylistic Studies

DAYTIME CLASSES

Chem	500	Special Studies	To be arranged
Chem	600	Seminar	F. 4:00
Chem	623	Physical and Chemical Methods of Separation	T. Th. 11:00, F. 8:00-12:00
Econ	525	Monetary Economics	M. W. F. 12:00-1:00
Econ	553	Contemporary Economic Issues	T. Th. 1:30-2:45
Econ	554	Seminar, Special Studies in Economics	T. Th. 12:00-1:15
Econ	555	Industrial and Labor Relations	M. W. F. 3:00-4:00
Econ	556	History of Economic Thought	T. Th. 9:30-10:45

El	550	The Community and the Elementary School	T. 1:00-3:00
Eng	551	Twentieth Century British Novel (3 cr.)	S. 12:00-2:30
Eng	640	Seminar in British Literature—Nineteenth Century (to 1870)	S. 12:00-2:30
Eng	650	Dissertation (varied credits)	By appointment
Eng	696	Seminar in the Teaching of College English	M. 3:00-5:30
Geog	517	General City and Regional Planning	M. W. F. 12:00
Geog	519	Urban Planning Basic Studies and Analysis	M. W. 3:00-5:00
Geog	590	Map and Photo Interpretation	M. W. F. 2:00
Geog	591	Geography Thought and Philosophy	T. Th. 5:00-6:15
Geog	593	Research II (Individual)	To be arranged
Grad	550	Research and Thesis	To be arranged
Hist	553	History of England Since 1688 (3 cr.)	M. W. F. 10:00
Hist	555	History of Soviet Russia (3 cr.)	M. W. F. 11:00
Mus	503	Music Literature of the Baroque Period	T. Th. S. 9:00
Mus	510	Seminar in Music Literature	M. W. F. 1:00
Mus	516	Analytical Techniques	T. Th. S. 10:00
Phys	521	Advanced Laboratory Practices I	T. Th. 9:00-12:00
Phys	533	Heat and Thermodynamics	M. W. F. 11:00
Phys	541	Analytical Mechanics I	M. W. 1:00
Phys	551	Electricity and Magnetism I	M. W. F. 10:00
Phys	565	Introduction to Nuclear Physics	M. W. F. 2:00
PolS	560	Latin America (3 cr.)	M. W. F. 9:00-10:00
PolS	564	Central and Eastern Europe (3 cr.)	M. W. F. 10:00-11:00
PolS	575	American Political Parties—Sec. 1 (3 cr.)	M. W. F. 11:00-12:00
PolS	575	American Political Parties—Sec. 2 (3 cr.)	M. W. F. 12:00-1:00
PolS	576	Legislative Process—Sec. 1 (3 cr.)	M. W. 4:00-5:15
PolS	576	Legislative Process—Sec. 2 (3 cr.)	M. W. 6:00-7:15
PolS	579	Modern Political Thought (3 cr.)	M. W. F. 1:00-2:00
PolS	580	Public Opinion (3 cr.)	M. W. F. 2:00-3:00
PolS	583	Federal Administrative Policy (3 cr.)	M. W. F. 3:00-4:00
PolS	584	Judicial Process—Sec. 1 (3 cr.)	T. Th. 9:30-10:45
PolS	584	Judicial Process—Sec. 2 (3 cr.)	T. Th. 1:30-2:45
PolS	599	Political Science Internship (1-6 cr.)	To be arranged
SpE	555	Practicum and Internship (2-4 cr.)	To be arranged

THE GRADUATE SCHOOL

Indiana University of Pennsylvania
Indiana, Pennsylvania

GENERAL INFORMATION

Location

Indiana University of Pennsylvania is located in Indiana, Pennsylvania, a community with a population of approximately 20,000. Indiana is 30 miles north of Johnstown and 60 miles northeast of Pittsburgh. Situated in the foothills of the Allegheny Mountains, Indiana has a climate that is conducive to study the year round.

University Catalog

Detailed information about the University, its academic requirements, the names of the faculty, and the facilities are described in the general catalog. This publication may be obtained by writing to the Registrar.

HISTORY OF THE GRADUATE SCHOOL

Graduate work was inaugurated at Indiana University of Pennsylvania in September, 1957.

Programs leading to the degrees Master of Education, Master of Arts, Master of Science, Doctor of Education, and Doctor of Philosophy are now available. Non-degree programs leading to certification as Learning Resources Specialist, Reading Specialist, and School Psychologist are now available. During the calendar year 1969 the institution conferred the Master's Degree on 265 graduate students: 211 the M.Ed., 38 the M.A., and sixteen the M.S.

In all graduate programs the objectives are (1) to encourage excellence in scholarship, (2) to provide for depth in the student's special field, and (3) to stimulate enthusiasm for continued cultural and professional growth.

Library

The University Library provides excellent facilities for graduate work with professional librarians readily available for assisting with specialized reference work.

The present book collection of 350,000 volumes grows at the rate of approximately 50,000 volumes annually. In addition

there are extensive holdings of periodicals (about 2900 current titles), microfilms, Microcards, curriculum materials, federal and state documents, and phonograph records.

The Rhodes R. Stabler Library was opened in 1961. It is designed to give efficient service through a uniform flow of library materials in an attractive, but functional setting. At least one professional librarian is always on duty to provide reference service. Book stacks are open to all students.

All periodicals and reference volumes are located on the main floor of the library. The book collection arrangement follows the Dewey Decimal Classification System. Books numbered 000 through 699, as well as the reserve book collection and microfilm and Microcard materials, are located on the ground floor. Books numbered 700 through 999, fiction, the curriculum materials collection, the children's literature collection, Pennsylvania collection, and government documents are located on the top floor.

Graduate students are both encouraged and expected to spend time in the Library. Particular attention is given by librarians to graduate students in procurement of needed materials and the further development of proficiencies. The Library subscribes to the spirit and the letter of the General Interlibrary Loan Code, which regulates the procurement of materials via interlibrary loan.

With the exception of those books which are reserved for special purposes, all books circulate for three weeks. Periodicals do not circulate.

Hours: 7:45 a.m.—10:30 p.m.—Monday through Thursday
7:45 a.m.— 9:30 p.m.—Friday
7:45 a.m.— 5:00 p.m.—Saturday
2:00 p.m.—10:30 p.m.—Sunday

Summer and vacation hours are posted on the door of the library.

Library Staff: William E. Lafranchi, Head Librarian; Ronald A. Steiner, Associate Head Librarian; Richard Chamberlin, Carolyn Grundy, Paul R. Hicks, David Kaufman, John Lucas, Katheryne Mallino, Joan Masnick, Elizabeth S. Parnell, Wanda Rife, Martha Scheeren, Daniel Shively, Marie E. Snead, Martha Sollberger, Dorothy Volm, Euphemia N. Waddell, Edward G. Wolf.

Learning Research Center

Housed in the Learning Research Center at Davis Hall are the Laboratory School, a control and production center for both open and closed circuit television, several special clinics, an audio-visual center, and teaching materials center.

The Laboratory School, with an enrollment of 215 students from kindergarten through sixth grade, provides an opportunity for graduate students to observe and to participate in problems relating to teaching.

The Audio-Visual Center provides graduate students with an excellent collection of films, filmstrips, and other audio-visual equipment. Students may learn how to use audio-visual materials through courses offered in this area.

The Computer Center

In addition to the services provided by the Rhodes R. Stabley Library and the Learning Research Center, computer services are available for graduate research studies. Full-time staff members provide assistance with programming and the distribution of data results.

Placement Service

Placement is a service offered by Indiana University of Pennsylvania to its graduates without charge. The services of the Placement Bureau are available to students who have received their Master's degree or who have been accepted as candidates for the degree in the Indiana Graduate School. Graduate students wishing to take advantage of placement service should complete the necessary forms with the Director of Placement.

FINANCIAL AID

Assistantships

Graduate assistants are employed by each department offering a program leading to the Master's or Doctor's degree. Full-time students interested in such appointments for the academic year beginning in September should request application forms from the office of the Assistant Dean of the Graduate School not later than March 1. Appointments are made by the chairman of the department concerned, with the approval of the Graduate School. The number of appointments and the size of the stipends awarded depend upon the approval of budget requests and therefore may vary from year to year. Tuition fees are waived for graduate assistants.

Scholarships

The Board of Trustees of the Indiana University of Pennsylvania has authorized the college Loan and Scholarship Committee to award some scholarship aid to meritorious graduate students. The following procedure has been established by the Loan and Scholarship Committee:

1. One \$50.00 scholarship be awarded each semester to that graduate student who best merits the award.
2. Three members of the Graduate Council serve as a committee to recommend the recipient to the Loan and Scholarship Committee.

3. Nominations for the award be made to the committee by the Dean of the Graduate School.

4. To be eligible for nomination the student must have completed twelve semester hours of graduate work at Indiana and be an approved candidate for the Master's degree at Indiana.

Kappa Delta Pi Graduate Scholarship

The Kappa Delta Pi Graduate Scholarship was established by Beta Gamma Chapter of this university to honor that member of the graduate group who is judged the ideal student. This award of twenty-five dollars is made each year by a committee of the local chapter and is awarded on the basis of scholarship and research competition.

Counselorships for Men

Appointments are available to men graduate students to serve as Hall Counselors and House Heads in undergraduate dormitories on and off campus. Background or training in counseling or personnel work is desirable though not essential. These appointments are made for each semester, and are usually renewable for the second semester at the regular stipend for a hall counselor. Requests for information and applications should be addressed to the Dean of Men. Completed application forms should be submitted to his office by April 1 for openings in the Fall.

Counselorships for Women

Several appointments are available to women graduate students to serve as counselors in residence halls. Counselors receive \$30.00 per month in return for working with undergraduates in the areas of social, academic, and emotional adjustment. Applications should be submitted to the office of the Dean of Women by March 25.

Veterans

Indiana is approved to offer training under the various G.I. Bills (Public Law 550) and Public Law 894 (disabled Korean veterans). Students who are entitled to training under one of these bills should contact the Veterans' Counselor immediately after being accepted for admission to Indiana in order to secure additional instructions. This procedure is necessary so veterans may be included on the monthly payrolls. The Office of the Veterans' Counselor is in Gordon Hall.

Housing Facilities

Room reservations can be made by writing to the Director of Housing. An advance registration deposit will not be required to reserve a room for summer sessions.

Students are not expected to room alone. Therefore, students are urged to apply in pairs. In this way each student is assured a congenial roommate. Single applications are handled to the best possible advantage, but the university prefers that students make their own choices whenever possible. Applications for rooms are filed in the order in which they are received.

Those in the Indiana Graduate School who desire housing facilities for the summer should write for information and make reservations with the Director of Housing. All housing arrangements should be cared for as early as possible.

The housing fee, which includes room, board, and laundry, is \$18.50 per week for women, \$18.00 for men.

Privately owned graduate student apartments are also available at reasonable rates the year round.

ACADEMIC INFORMATION

Admissions

Admission to the Graduate School is required before any interested person may enroll in any graduate course for graduate credit. The following policy has been established by the Graduate Council:

1. The applicant must present a Bachelor's degree from a college or university that has been accredited by the Middle States Association of Colleges and Secondary Schools or the appropriate regional accrediting agency.
2. The applicant must present a transcript of his undergraduate work showing a 2.6 honor point value for all four years of his undergraduate work. The 2.6 assumes a grade of A to have 4 honor points per credit hour, a grade of B to have 3 honor points per credit hour, and a grade of C to have 2 honor points per credit hour. If the applicant's undergraduate record does not meet this 2.6 honor point value, or if he is a graduate of an unaccredited college, he may be admitted by making a satisfactory score on an entrance qualification examination.
3. If the applicant is in the field of education and interested in certification, he must possess a Provisional Pennsylvania Teacher's Certificate or its equivalent in the field in which he wishes to do graduate study.
4. A satisfactory recommendation must be obtained from the applicant's undergraduate department or from qualified references.
5. Students applying for the degree in Music Education must present evidence of musical maturity by means of a tape recording of their major area of music performance. This should be mailed to the chairman of the Music Department with a covering letter at the time of application.

Admission to the Graduate School does not automatically mean that the student is a candidate for an advanced degree at Indiana University.

Steps Necessary For Admission To The Graduate School

1. The applicant will file an application for graduate work with the Dean of the Graduate School. Write early to the Dean of the Graduate School for application forms. (Check calendar on pages 4 and 5 for deadline date.)
2. Each applicant will present a transcript of all undergraduate work taken for the Bachelor's degree. Transcripts of previous work taken at Indiana need not be submitted.
3. Each applicant may be required to have a personal interview with the Dean of the Graduate School or an assigned faculty member.
4. No one presently on the staff at Indiana University may be enrolled for a graduate degree.

Graduate Record Examination

The Graduate Record Examinations are administered periodically at the Indiana University of Pennsylvania. These examinations are required or recommended of candidates for admission to many American graduate schools and of applicants for graduate fellowship awards.

While Graduate Record scores are not required for admission to the Graduate School at Indiana, they are required for admission to candidacy in all degree programs. Therefore the examinations should be scheduled early in the degree candidate's work.

A Bulletin of Information with registration form may be obtained from the Graduate Office, Indiana University of Pennsylvania or from The Educational Testing Service, Box 955, Princeton, New Jersey 08540.

Academic Load

Many graduate students depend upon part-time or full-time employment to meet their expenses. A student who is thus employed must recognize the time demands of his work schedule in planning his graduate program. The Graduate School assumes that its facilities should be made available only to students who can benefit from graduate study to a maximum extent.

It is possible for students to schedule a full-time load in many of the approved programs. Eight to sixteen semester hours of work per semester is regarded a full-time graduate schedule. Full-time students should submit their proposed schedule for approval as early as possible. For part-time stu-

dents who are teaching, a maximum of four semester hours or two courses may be scheduled each semester. The number of semester hours of work obtained during summer sessions shall not exceed the number of weeks of attendance.

No student may accumulate more than six hours in "tour" courses toward a degree.

Programming and Registration

The responsibility for being properly programmed and registered rests with the student. For each session the student, following the curriculum in this publication under his particular major field, prepares a schedule of courses to fit his individual needs. Normally he schedules content courses in his major as rapidly as they are available. The schedule is submitted to the Dean of the Graduate School for his approval. The student is responsible for following the specified procedure.

Fees

(Subject to change without notice)

Tuition Fee \$36.00 per semester hour for Pennsylvania residents.
\$43.00 per semester hour for out-of-state residents or students employed out of state.

Tuition Fee for Music Education Students will be at the same rate for course instruction but private instruction will be charged at the rate of \$50.00 per semester hour.

Graduation Fee \$5.00

Service Fee. The service fee for the regular summer session is \$10.50, and \$3.75 each for the pre- and post-session.

During the academic year, part-time students (seven hours or less) will pay a service fee of \$11.00. Full-time students (eight hours or more) will pay \$30.00.

Late Registration Fee \$1.00 per credit per day will be assessed a student who fails to complete registration, including payment of fees, on the dates and within the hours specified in the published procedure for registration for any particular semester or term.

Master's Cap, Hood and Gown Fee Candidates who have been accepted by the Graduate School for the Master's degree are required to purchase or rent from the college bookstore a Master's cap, hood, and gown to be worn at the graduation exercises. The fee for these items is nominal.

Thesis or Research Project Binding Expenses . . . The binding of the required copies of the thesis or the research project is an expense which must be cared for by each graduate candidate. The current charge for binding a thesis is \$5.00 per copy and for binding a research project, \$3.00 per copy. The library copy is required to be hard bound.

Refunds

There will be no tuition refunds except in cases of prolonged illness. A request for such a refund must be accompanied by a medical certificate indicating prolonged illness and inability to work or attend classes. Half of the tuition fee will be refunded if the request is made prior to the completion of one-third of the scheduled class periods. No refund will be made after one-third of the class meetings.

Withdrawals from Classes

If a student decides to withdraw from a course before the middle of any semester or session, he may do so by notifying the Graduate Office in writing of his intent to withdraw. In this case a grade of W may be entered on the permanent record. A student withdrawing from a course after the middle of a semester or session will automatically receive an F. If withdrawal is caused by a health condition or for another approved reason, the grade may be indicated as incomplete and made up in accordance with an agreement between the instructor, student, and Dean of the Graduate School.

Class Cancellation

It is the policy of the Graduate School not to cancel regularly scheduled classes because of weather conditions, nor does the School issue announcements over radio stations or in newspapers or give information through its switchboard that classes will be suspended because of such conditions. In cases of an emergency which disrupts transportation facilities or creates personal problems, students should make decisions as to attendance which appear appropriate to them in their particular circumstances.

Scholarship Requirement

A candidate must have maintained a grade point average of 3.0 (B), in all graduate work. Only grades "A," "B," or "C" are acceptable toward a Master's degree. Marking system: grade of "A," 4 quality points; "B," 3 quality points; "C," 2 quality points. The work in any course must be completed by the final meeting of the particular class. An incomplete grade will be issued only when the work is interrupted due to a

health condition. Under such a condition the "I" grade must be removed within sixty days following the end of the session.

Transfer of Credit

Resident (on main campus) graduate work of high quality done in a recognized graduate school elsewhere and coming within the five-year time limit may be accepted to the extent of 6 semester hours. Such credits will be transferred to the Graduate School at Indiana only after the student has applied for admission to candidacy for the degree, and then only if the chairman of the department concerned, after conference with the student, recommends to the Dean for his approval the transfer of such credits as coordinate with the student's program in his chosen field. Work already applied toward another degree cannot be accepted. The final six hours in any program must be completed at Indiana.

No credit will be granted toward a Master's Degree for work completed in extension courses or in off-campus centers of another institution. Transfer credit will not be accepted for courses in which a grade lower than B or its equivalent has been received. Applications for transfer of credits, which should be filed prior to taking course work elsewhere, are available in the Graduate Office.

Student Responsibility

The graduate student is expected to know the requirements for the degree he plans to earn. While the officers and teachers of the Graduate School will endeavor to aid in any way possible, the responsibility for any error in his own enrollment or in the interpretation of the requirements rests with the student.

Auditors

Students not eligible to enroll for credit may enroll as auditors. Course fees are the same as for those enrolled for credit. Anyone qualified for admission is expected to apply formally for admission before requesting permission to enroll in any graduate class.

The Advisory System

The purpose of the advisory system is to insure that the student's work follows a coherent, well-balanced, and unified program for his professional growth and development. The procedure for the administration of the system varies among the departments and is under the jurisdiction of the department chairman.

Application for Graduation

The student is responsible for submitting a formal written application for graduation and for fulfilling all requirements for the degree in accordance with the calendar in this bulletin.

For August graduation, all course work must be completed by the end of the preceding Main Summer Session. (Formal applications for May graduation are due March 1; for August graduation, June 1; and for January graduation, October 1.)

Transcripts of Graduate Work

Transcripts of one's graduate work may be obtained by contacting the registrar's office. The fee for this service is \$1.00 per transcript.

Permanent Certification Requirements

By action of the State Council of Education, all college certificates issued after October 1, 1959, require the completion of at least twelve hours of post-baccalaureate work for permanent certification. Provisional certificates issued after October 1, 1963, require twenty-four semester hours for permanent certification. Of the twenty-four hours at least twelve must be in the field of certification.

All teachers who are able to qualify for admission to a graduate program and who are able to profit by graduate work should be encouraged to do the work required for Permanent Certification in a Graduate Program in order that it may also be used toward a Master's degree.

For teachers in the public schools, the graduate programs are designed to meet the credit requirements for permanent certification. The programs at Indiana have the program approval status with the Pennsylvania Department of Public Instruction.

REGULATIONS FOR PRINCIPAL'S CERTIFICATES IN PENNSYLVANIA

On October 1, 1964, new regulations for the issuance of principal's certificates became effective. The new regulations for the provisional elementary or secondary principal's certificate are substantially as follows: An applicant shall: (1) Hold a Pennsylvania College Certificate. (2) Have three years of successful experience. (3) Complete 45 semester hours of graduate study, including a Master's degree with the following minimum requirements: (a) 12 semester hours in an academic field other than psychology; (b) graduate study in developmental and remedial reading; (c) 15 semester hours distributed among administrative processes, curriculum and instructional processes, and the history and role of the school in society; and (d) documentary evidence of proficiency in English. The College Certificate and experience must be at the level (elementary or secondary) for which administrative certification is requested.

The Cooperative Administration of the Regulations by Indiana University of Pennsylvania and The Pennsylvania State University

An applicant for a Provisional Elementary or Secondary Principal's certificate must be endorsed by an institution with an approved program in administration. Indiana does not provide a program in administration but has a cooperative arrangement with The Pennsylvania State University whereby a student interested in this certification may secure the endorsement of the approved institution by the following plan.

1. If a candidate for one of these certificates completes graduate work at Indiana for a Master of Education Degree in Elementary Education or in an academic field, he may complete the post master's-work (at least 15 hours) at The Pennsylvania State University.

2. When the student applies for admission to candidacy for the M.Ed. at Indiana, he should indicate his intention to seek principalship certification. The Dean of the Indiana Graduate School will review the candidate's qualifications and may recommend the candidate to The Pennsylvania State University.

3. The Pennsylvania State University decides how much of the graduate work completed at Indiana may be counted towards the 45 hours needed for certification endorsement. Part or all of the minimum 30 hours earned for the M.Ed. at Indiana may be acceptable. The student should plan to schedule reading courses and courses in measurement and statistics as electives in his program at Indiana.

4. The completion of the research requirement at Indiana may be accepted as documentary evidence of proficiency in English.

5. After completion of his graduate program at Indiana, the student should seek admission to the Graduate School of The Pennsylvania State University indicating his interest in principalship certification. For application forms and information write to: The Assistant Dean for Admissions, The Graduate School, The Pennsylvania State University, University Park, Pennsylvania.

6. The provisional certificate based on the 45 hours is valid for serving as a Principal for five years. To make this provisional certificate permanent, 15 additional approved graduate hours are required and may be completed at The Pennsylvania State University or other institutions with an approved administration program.

THE MASTER'S DEGREE

The Graduate School at Indiana offers work leading to the degree Master of Education in the following fields:

Art	Mathematics
Biology	Music
Business	Physics
Chemistry	Reading
Counseling and Guidance	Science
Elementary Education	Social Science
Elementary Science	Spanish
English	Special Education
Geography	Speech & Hearing
Home Economics	

The Master of Arts degree is conferred in:

Counseling Services	Geography
English	History
Music	

The Master of Science degree is conferred in:

Biology	Geography
Chemistry	Mathematics
Physics	

Admission to Candidacy for a Master's Degree

The student must complete the following steps to qualify for admission to candidacy:

1. Submit an official application for admission to candidacy.

2. Submit a transcript of graduate work completed at other institutions.
3. Complete at least six semester hours of graduate work at Indiana.
4. Receive satisfactory course evaluation from student's graduate instructors.
5. Submit satisfactory scores in the Graduate Record Examination (aptitude and advanced tests).
6. Submit a tentative program of study for the completion of the graduate program.

The application for admission to candidacy, the transcript of the graduate record, and the tentative program of study should be submitted by the student to the Dean of the Graduate School. Acceptance to candidacy requires the approval of the Chairman of the major department and the Dean of the Graduate School.

Semester Hours Required for a Master's Degree

A minimum of thirty semester hours of approved graduate work beyond a Bachelor's degree is required. A well balanced, unified and complete program of study will be required regardless of the minimum credit requirement. Many students may find it necessary to earn more than the minimum number of credits before they will be regarded ready for the degree. Indiana University of Pennsylvania is not committed to grant a degree upon the completion of thirty credits.

Time Limit

Thirty semester hours must be completed within the five-year period immediately preceding the date when all the requirements for the degree are completed. Any work accepted by transfer must also fall within this period. For justifiable reasons the Graduate Council may extend the period.

Residence

A minimum of ten semester hours will be required to be taken during summer sessions. The ten hours need not be taken in any one summer but may be extended over two or more different summers. During summer study, it is assumed that the student is not employed or engaged in any other work, and that his graduate study has top priority in his schedule. A minimum of twenty-four hours must be completed on the Indiana campus either in summer or in part time or full time study during the academic year.

THE RESEARCH REQUIREMENT

Candidates for the M.A., M.S., or M.Ed. degree must satisfy the research requirement as established by the Graduate Council and designed by the departments of the various graduate fields. This requirement is essentially that every candidate must conduct some independent study related to his major field and report on this study with a written thesis or research project, a recital, or another approved method. The degree sought, the ability and record of the candidate, and the nature of the proposed research are factors in determining how each candidate will be advised to satisfy this requirement.

Purposes of the Research Requirement

The initiation, conduct, and description of a research study results in professional growth usually not attained in other ways. The completed requirement certifies that the student is competent to identify a research topic and to pursue research in his field. An acceptable research report should show evidence that the student:

1. Has comprehended the essentials of his problem, has followed a well-organized plan of work, and has presented satisfactory solutions.
2. Has made a comprehensive study of the related literature.
3. Has made an independent and intensive study of the problem.
4. Has a practical working knowledge of research procedures.
5. Has shown the ability to write in a professional style.
6. Has reached conclusions justified by the findings.
7. Has produced a report of value to the subject field or to professional education.

Distinction Between a Thesis and a Research Project

The study may be in a subject field or in professional education. A thesis will carry from two to four hours of graduate credit as determined by the chairman of the thesis committee and the Dean of the Graduate School. The Dean of the Graduate School will apply the thesis credit to the student's program in the Subject Matter Concentration Area or in the area of Professional Studies depending on the nature of the topic selected. The research project does not carry graduate credit and, unlike the thesis or recital, may not be counted as part of the thirty semester hours required for the degree.

The basic distinction between a research project and a thesis is as follows: the project must make a contribution to the student by helping him to improve his teaching or other educational activity; the thesis, in addition, should contribute new knowledge to the field of study.

The project need not represent original research and may consist of adapting other findings to the student's local situation or of repeating other investigations in different circumstances. The thesis, however, should make a contribution to the student's field of inquiry—a far more rigorous condition than that established for the project.

Minor distinctions may be made with regard to the extent or scope of the study and the level of research competence needed to accomplish the study, but these are distinctions subordinate to the basic one given above. Deciding if a particular activity is of a thesis or project nature is primarily the responsibility of the student's adviser who must determine if the study will truly contribute to the field or if it will adapt available data to a new situation.

Steps in Satisfying the Research Requirement by Submitting a Research Project

1. The student schedules the course or courses designated by his major field department as designed to assist him in developing the necessary research techniques. Since many projects require considerable time for completion, it is desirable to schedule this work early in the graduate program.
2. The student selects an area of interest in which to do his research.
3. The student gathers from his own experience and from a perusal of completed research some specific topics within his area of interest that might satisfy the research requirement.
4. The student discusses these tentative research plans with the Chairman of his major field department.
5. The student, with the guidance and approval of the Chairman, selects a graduate faculty member who is qualified in the area of the research to act as his adviser. The student secures the agreement of the designated faculty member.
6. The student, with the guidance of his adviser, outlines the nature and scope of a specific research topic.
7. The student develops his topic outlined into a formal research proposal. (A suggested proposal outline is available in the Research Office, Room 203, Clark Hall.) The adviser approves the research proposal before it is typed in multiple copies.

8. The student types three copies of his research proposal (one for himself, one for his adviser, and one for the Director of Research) and submits the latter two to his adviser together with the Research Approval Form (available in the Appendix of this bulletin).
9. The adviser signs Section II of the Research Approval Form and sends it, together with one copy of the research proposal, to the Director of Research.
10. The Director of Research reads the research proposal. He signs Section III of the Research Approval Form and sends it together with the research proposal to the Dean of the Graduate School. If the Director of Research desires certain minor changes in the proposal these are forwarded to the adviser. If major revisions are necessary, the research proposal is returned to the adviser.
11. The Dean of the Graduate School, on receiving the student's research proposal and the Research Approval Form signed in Sections II and III, notifies the student by letter that his research proposal has been approved and if successfully completed will satisfy the Graduate School's research requirement. In most cases the approval of the research proposal expires after one year.

NOTE: The student must complete the first eleven steps before applying for graduation.

12. The Director of Research files the research proposal in the student's folder in the Graduate School Office.
13. The student conducts his research. The adviser is frequently given progress reports. Changes in the approved research proposal are permitted provided they have been discussed with the adviser, and the Director of Research has been notified in writing.
14. The student submits the first rough draft of his research project to his adviser. The main emphasis in this draft is organization, sufficiency of data, and accuracy of analysis.
15. After the adviser reads the first draft, a conference is held to discuss any necessary revisions.
16. The student prepares the final rough draft. This draft meets the style and format requirements outlined in W. G. Campbell's **Form and Style in Thesis Writing** (available in the student bookstore). It should be free from errors in spelling, punctuation, grammar, and paragraphing.
17. The student submits the final rough draft of his research project to his adviser. The adviser reads this draft to insure that the suggestions made during the conference on the first draft have been included. He also checks the general format and style.

18. The final rough draft is sent by the adviser to the Director of Research.

NOTE: The deadline date for the final draft to be in the Research Office is December 1 for January graduation; April 1 for May graduation; and July 1 for August graduation. Only minor corrections are permitted after the deadline date, and in the event that a major revision is called for, the student is removed from the graduation list. Notification of this removal is by letter from the Director of Research.

19. The final rough draft is returned to the adviser by the Director of Research with instructions for typing the final copies and required abstracts.

20. The finished typed copies (three for the University and any additional copies desired by the student) and the required abstracts are submitted to the Director of Research.

NOTE: These finished copies and required abstracts must be in the Research Office at least one week before the commencement date. The student should secure necessary signatures before turning the final typed copies into the office of the Assistant Dean of Research.

21. The Director of Research sees that the copies are bound and distributed. The three University copies are filed in the library, in the department office, and in the Research Office.

22. The abstract of the research project is printed in the annual **Research Bulletin**.

Steps in Satisfying the Research Requirement by Submitting a Thesis

The procedure for satisfying the research requirement by submitting a thesis is the same as for the research project with the following "step" substitutions:

6. The student, with the guidance of his adviser, outlines the nature and scope of a specific research topic. The adviser determines whether or not the proposed research will contribute new knowledge to the field of study and thus qualify as a thesis. The adviser and the chairman of the major department select a thesis committee. This committee normally consists of the adviser, who acts as chairman; the chairman of the major department; the Director of Research; and at least one other faculty member.

8. In addition to his own copy, the student prepares one copy of his proposal for each member of his committee and submits them, together with the Research Approval Form

(available in the Appendix of this bulletin) to his adviser. The adviser distributes them to the committee members and at the same time arranges for a thesis committee meeting on a date no less than one week hence. The adviser informs the secretary of the Research Office of this date and she sends out official notices, indicating the time and the location of the meeting, to the student and to each member of the Committee.

9. The thesis committee meets at the designated time and place to discuss the nature of the proposed research and the method to be used in developing the topic. The members of the committee sign Section IV of the Research Approval Form. Any minor revisions in the proposal made by the committee are observed by the student as he prepares his rough draft. Should the committee suggest major changes, the proposal is resubmitted to the committee before Section IV of the Research Approval Form is signed. (This necessitates the formal calling of another thesis committee meeting.)
10. The Director of Research sends the signed Research Approval Form and his copy of the thesis proposal to the Dean of the Graduate School.
11. Substitute "Sections II and IV" for "Sections II and III."
17. The student prepares one copy of his final rough draft for each member of the committee and submits them to his adviser. The adviser distributes them to the committee members and at the same time arranges for a thesis committee meeting on a date no less than one week hence. The adviser informs the secretary of the Research Office of this date and she sends out official notices, indicating time and location of the meeting, to the student and each of the committee members.
18. The thesis committee meets at the designated time and place. The student briefly outlines the significant findings of his research and then answers questions put to him by committee members concerning the content, organization, and conclusions of his study. The members of the committee sign Section V of the Research Approval Form. The chairman of the committee determines the grade to be received for the thesis and records it on the Research Approval Form at the time he signs.

NOTE: The deadline date for the thesis committee meeting to approve the final rough draft is December 1 for January graduation; April 1 for May graduation; and July 1 for August graduation. If this meeting is not held by the deadline date the student is removed from the graduation list. Notification of this removal is by letter from the Director of Research.

STUDENTS PLANNING TO GRADUATE IN AUGUST MUST REMEMBER THAT MANY FACULTY MEMBERS ARE NOT ON CAMPUS DURING THE SUMMER. THEREFORE, DATES FOR THESIS COMMITTEE MEETINGS SHOULD BE WELL IN ADVANCE TO INSURE THAT THE FACULTY MEMBERS WILL BE AVAILABLE.

19. At the time of approval, the Director of Research gives the student instructions for typing the final copies and required abstracts.
22. The abstract of the thesis is printed in the annual **Research Bulletin**.

Steps in Satisfying the Research Requirement by Giving a Recital

Students planning to satisfy the research requirement by giving a recital work under the direction of the chairman of the music department and an applied teacher. The outlined procedure for the Graduate Recital is available in the Music Department office. Jury approval of the student audition (Step 2 of "Suggested Procedure for the Graduate Recital") must be obtained by December 1 for January graduation; April 1 for May graduation; and July 1 for August graduation. The student is also responsible for preparing a report of his recital for the Director of Research (Step 5 of "Suggested Procedure for the Graduate Recital"). A booklet describing the form and style of this report is available in the Research Office. The recital program is printed in the annual **Research Bulletin**.

Other Methods of Satisfying the Research Requirement

Other accepted forms of research, as approved on an individual basis or as a policy of a particular degree or department, must be completed by December 1 for January graduation; April 1 for May graduation; and July 1 for August graduation.

Exceptions to Policy

The methods for satisfying the research requirement as described above are those established by the Graduate Council and implemented by the Dean of the Graduate School. Any exceptions to these procedures must have prior approval of the Dean of the Graduate School.

Duplicate copies of the research proposal and drafts of a thesis or project should be retained by the student. The Graduate School cannot accept responsibility for the loss of such materials.

ADVANCED GRADUATE STUDY BEYOND MASTER'S DEGREE

Students may find that more courses are offered that would be of benefit to them than they are able to include in their Master's degree program. These students are encouraged to continue their training after receiving their Master's degree and this additional training will be recognized by many school districts for salary purposes and by the Bureau of Teacher Certification for certification purposes. Students are advised, however, that most graduate schools have their own residence requirements and will probably not accept more than 30 credit hours (or Master's equivalent) of graduate credit earned at Indiana toward the Doctor's degree at their institution.

Appropriate certificates may be awarded to the student who completes an additional 15 or 30 credit hours beyond the Master's degree. For purposes of this certificate these credits must be apportioned in a manner approved by the Dean of the Graduate School.

Eligibility of Teaching Staff

Members of the faculty of Indiana University of Pennsylvania with a rank of Assistant Professor or above (or equivalent), may not receive a graduate degree from this institution. This regulation applies also to any faculty member employed by this institution **full-time** at the instructor rank unless such an individual is already an approved candidate for a degree in the Graduate School of I. U. P. at the time he is given full-time employment as an instructor. Faculty members may, however, register for work in the Graduate School and apply the credit toward graduate degrees to be conferred by other institutions.

THE DOCTOR'S DEGREE

The Graduate School offers a program leading to the Doctor of Education degree in Elementary Education and a program leading to the Ph.D. degree in English and American Literature.

THE DEGREE OF DOCTOR OF EDUCATION

The Doctor of Education degree is a professional degree designed primarily for those who desire to continue advanced study toward becoming superior teachers or teacher educators or teacher supervisors.

This degree is conferred for distinguished achievement in a specialized area of education, for demonstrated ability in independent research, and in recognition of a significant contribution to education as evidenced by the dissertation. The degree is not awarded until the candidate has demonstrated a comprehensive understanding of the foundations of education and proficiency in applying this understanding to his field of specialization.

Each department offering the degree has beyond the general requirements of the Graduate School its own special requirements to be met and may, but only with the approval of the Graduate Council, waive or modify any of the general requirements. The department's detailed description of the degree should be consulted.

General Requirements

A minimum of three academic years of study beyond the Bachelor's degree, or the equivalent, or two years beyond the Master's degree, must be devoted to the doctoral program.

After the student has been declared a candidate for the degree a maximum of five years is allowed for the completion of work.

A minimum of seventy-eight semester hours of credit, exclusive of research credits, must be earned beyond the Bachelor's degree.

Candidates for the doctor's degree are expected to enroll as full-time resident students and must serve a residency of at least two consecutive semesters.

Transfer credit is limited to the credit-equivalent of a Master's degree, except in special cases approved by the appropriate department chairman and the Dean of the Graduate School.

Admission to Candidacy

A student may be declared a candidate for the Doctor of Education degree only after he has met the following requirements:

- (1) completed at least twelve semester hours of credit beyond the Master's degree with at least a B average.
- (2) filed with the Dean of the Graduate School evidence of at least two years of satisfactory teaching experience, or its equivalent as established by the major department.
- (3) performed satisfactorily in the candidacy examination administered by the major department.
- (4) filed with the Dean of the Graduate School acceptable scores in the Graduate Record Examination, including the special examination in education.
- (5) filed with the Dean of the Graduate School a program of study approved by the major department.

A student must be accepted as a candidate before he has completed thirty hours of credit beyond the Master's degree. In Elementary Education the student must have the approval of the department to go beyond forty-five hours of graduate work.

The Advisory Committee

The candidate's advisory committee is normally composed of five persons: the chairman of his major department and four additional members of the faculty of the University, including the research adviser, who functions as chairman. The department chairman appoints the committee at a time between the student's candidacy examination and the comprehensive examination. Ex officio members of the committee are the Dean of Graduate School, or his representative, and the Director of Graduate Research at the University. The committee administers the comprehensive examination, supervises the candidate's research activity, and evaluates the dissertation.

The Candidacy Examination

The candidacy examination, which may be written, or oral, or both, and which may serve also as the final examination for the Master of Education degree (where a department requires such an examination), is administered by the department of the student's principal subject in his area or areas of specialization. This examination may not be taken until the student has completed at least one year of study beyond the Bachelor's degree. Scores on the examination must satisfy the student's advisory committee.

The Comprehensive Examination

The comprehensive examination is given to determine whether the student has made satisfactory progress in his study, and to determine the likelihood that he will pursue research for his thesis profitably and meet training requirements for the degree. The examination is in four parts: History and Philosophy of Education; Psychology and Sociology of Education; Measurement, Evaluation and Statistics; the candidate's major field of study.

This examination is both written and oral and is administered by the advisory committee after the student has completed forty-five hours of work beyond the Bachelor's degree and before he has completed sixty. The examination is scheduled three times a year, in November, March and July.

The Plan of Study

Preparation for the degree of Doctor of Education is based on (1) the study of the history and philosophy of education, the psychology and sociology of education, and measurement, evaluation and statistics; (2) a concentration or major in counseling and guidance, educational administration, educational psychology, elementary education, or special education; (3) a minor field of study (usually but not necessarily from a department other than education).

The program of study must be planned in consultation with the department of major study and must be approved by the Dean of the Graduate School. The student should plan his course of study with his department so as to meet both departmental and general Graduate School requirements. The plan of study should designate (1) major field and minor area or areas of concentration, (2) courses to be taken, including a sequence in statistics and computer language, (3) the general field of research, (4) the names of members of the advisory committee, and (5) the subject (tentative) of the dissertation.

The plan of study must be filed with the Dean of the Graduate School as a part of the student's petition for candidacy.

Educational Administration

Indiana does not offer the Doctor of Education degree in Educational Administration, but does provide for those interested in such a degree, or in the principal's certificate, through a cooperative arrangement with the Pennsylvania State University. For an account of this arrangement see above, p. 25.

Statistics and Computer Language

For the Doctor of Education degree the candidate must pass a sequence of courses in statistics as prescribed by the major department. He must also demonstrate by examination, or through evidence of training satisfactory to the major department, a competence in computer language.

These requirements may be met after the time of admission to candidacy, but necessary training in statistics and computer language should be scheduled early in the candidate's program.

Review of Research Proposal

After the candidate has passed the comprehensive examination and after he has done extensive preliminary research, he must appear before his advisory committee to defend his research proposal. A copy of this proposal, prepared according to directions supplied by the Director of Graduate Research must be in the hands of each committee member at least two weeks in advance of the meeting. The proposal must be found satisfactory by all members of the committee before the candidate may proceed with the dissertation.

The Dissertation

A dissertation is required of all candidates for the Doctor of Education degree. The thesis must demonstrate the candidate's mastery of the area of his research. It must embody the results of an original investigation in his principal field of

study. It must give evidence of an exhaustive study of a specialized field and must provide an authoritative statement of knowledge on the subject or produce a new interpretation by rearrangement or reanalysis of existing data. The work must provide a definite contribution to knowledge of sufficient importance to warrant its publication. The student must schedule at least three credits in research each of his last two semesters. There is no maximum on the number of credits he may receive for his dissertation. He may schedule in research up to three credits a semester from the time at which the dissertation subject is approved by the advisory committee.

Dissertation Review Meeting

After the doctoral thesis has been accepted by the candidate's research adviser, a finished copy is presented to the Dean of the Graduate School, from whom it circulates to all members of the advisory committee. At a time convenient to all, the candidate shall then request a formal meeting of the advisory committee in order to secure approval of the dissertation. The dissertation must be approved by each member of the advisory committee.

Publication of the Dissertation

After the dissertation has been approved and accepted by the major department and by the advisory committee, two copies of the dissertation and two copies of an abstract must be submitted to the Graduate Council through the office of the Dean of the Graduate School. The major department may require a third copy for the department archives. Instructions on the final form of the dissertation are available at the office of the Director of Graduate Research.

The dissertation must be microfilmed according to the plan provided by University Microfilms, Ann Arbor, Michigan, as outlined under the Ph.D. requirements (see page 53).

Re-examination

A student who fails the candidacy examination, or any part of the comprehensive examination, or any of the examinations in statistics or computer language, may present himself for re-examination not earlier than one semester later nor later than one year after the time of the first examination. No student will be allowed a third examination without a recommendation to that effect from the department in which he has done his major work and the approval of the Graduate Council.

Application for Graduation

Formal application for graduation must be filed with the Dean of the Graduate School not later than two months prior to the date of the University Convocation at which the candidate expects to receive the Doctor's degree.

THE DEGREE OF DOCTOR OF PHILOSOPHY

The Doctor of Philosophy degree is conferred for distinguished achievement in some particular field of scholarship and for demonstrated ability for independent research in a subdivision of this field. No specific number of course credits entitles a student to the degree.

Each department offering the degree has beyond the general requirements of the Graduate School its own special requirements to be met, and may, but only with the approval of the Graduate Council, waive or modify any of the general requirements. The department's detailed description of the degree should be consulted.

General Requirements

A minimum of three academic years of study beyond the Bachelor's degree, or the equivalent, or two years beyond the Master's degree, must be devoted to the doctoral program.

After the student has been declared a candidate for the degree a maximum of five years is allowed for the completion of work.

A minimum of sixty semester hours of credit, exclusive of research credits, must be earned beyond the Bachelor's degree.

Beyond the Bachelor's degree one academic year of full-time enrollment on the Indiana University campus is required to fulfill residence. This requirement may be satisfied by enrolling for two semesters or for one semester and a summer.

Transfer credit is limited to the credit-equivalent of a Master's degree, except in special cases approved by the appropriate department chairman and the Dean of the Graduate School.

Admission to Candidacy

A student may be declared a candidate for the Doctor of Philosophy degree only after he has met the following requirements:

(1) completed at least twelve semester hours of credit beyond the Master's degree with at least a B average.

(2) performed satisfactorily in the candidacy examination administered by the major department.

(3) filed with the Dean of the Graduate School acceptable scores in the Graduate Record Examination, including the special examination in the candidate's field.

(4) filed with the Dean of the Graduate School a program of study approved by the major department.

A student must be accepted as a candidate before he has completed twenty-four hours of credit beyond the Master's degree.

The Advisory Committee

The candidate's advisory committee is composed of five persons: the chairman of his major department and four additional members of the faculty of the University, including the research adviser, who functions as chairman. The department chairman appoints the committee at a time between the student's candidacy examination and the comprehensive examination. Ex officio members of the committee are the Dean of the Graduate School, or his representative, and the Director of Graduate Research at the University. The committee administers the comprehensive examination, supervises the candidate's research activity, and evaluates the dissertation.

The Candidacy Examination

The candidacy examination, which may be written or oral, or both, and which may serve also as the final examination for the Master's degree (where a department requires such an examination), is administered by the department of the student's principal subject. This examination may not be taken until the student has completed at least one year of study beyond the Bachelor's degree. Scores on the examination must satisfy the student's advisory committee.

The Comprehensive Examination

The comprehensive examination is given to determine whether the student has made satisfactory progress in his study, and to determine the likelihood that he will pursue research for his thesis profitably and meet training requirements for the degree. It may be both written and oral and is designed by the candidate's committee to test the student's knowledge in his major field of specialization and supporting fields. It is not necessarily confined to the areas in which the student has taken course work at Indiana or elsewhere.

This examination may not be taken until the student has completed at least one and one-half years of study beyond the Bachelor's degree.

The Plan of Study

Preparation for the degree of Doctor of Philosophy is based on the study of a major subject, to which one or more minors may be added. The program of study must be planned in consultation with the department of major study and must be approved by the Dean of the Graduate School. The student should plan his course of study with his department so as to meet both departmental and general Graduate School requirements. The plan of study should designate (1) major field and minor areas of concentration, (2) courses to be taken, (3) foreign languages in which reading proficiency is to be attained,

(4) the general field of research, (5) the names of members of the advisory committee, and (6) the subject (tentative) of the dissertation.

The plan of study must be filed with the Dean of the Graduate School as a part of the student's petition for admission to candidacy.

Foreign Language Requirements

The candidate for the Doctor of Philosophy degree is required to demonstrate a competent reading knowledge of two foreign languages appropriate to the general area of study or (upon recommendation of his advisory committee) a reading knowledge of one foreign language together with a comprehensive knowledge of its literature. In the first case the requirements for either or both of the languages may be met by passing a third-year college course in a foreign language, with a minimum grade of C, within five years (or less, at the discretion of the department) of admission to the Graduate School. In the second case the passing of at least two graduate courses in a foreign literature, conducted in the language of that literature, is required. Otherwise the requirement of competence in an approved language must be met by passing an examination proving the student's ability to read in that language in his general area of study.

Language examinations are given four times a year at times and places designated in the current calendar of the Graduate School. Students who desire to be scheduled must file applications at least five weeks in advance of the examination date.

Examinations in French, German, Russian, and Spanish are administered by the Educational Testing Service. The fee is \$7.00. All other language examinations are administered by the Foreign Language Department of the University. For these there is no fee.

The student should acquire proficiency in the foreign language early in his graduate career and well before he starts reading for the comprehensive examination, but he should not present himself for examination until he feels confident of passing.

Review of Research Proposal

After the candidate has passed the comprehensive examination and after he has done extensive preliminary research, he must appear before his advisory committee to defend his research proposal. A copy of this proposal, prepared according to directions supplied by the Director of Graduate Research, must be in the hands of each committee member at least two weeks in advance of the meeting. The proposal must be found satisfactory by all members of the committee before the candidate may proceed with the dissertation.

The Dissertation

A dissertation is required of all candidates. The thesis must demonstrate the candidate's mastery of the area of his research. It must embody the results of an original investigation in his principal field of study. It must give evidence of an exhaustive study of a specialized field and must provide an authoritative statement of knowledge on the subject or produce a new interpretation by rearrangement or reanalysis of existing data. The work must provide a definite contribution to knowledge of sufficient importance to warrant its publication.

The student must schedule at least three credits in research each of his last two semesters. There is no maximum on the number of credits he may receive for his dissertation. He may schedule in research up to three credits a semester from the time at which the dissertation subject is approved by the advisory committee.

Dissertation Review Meeting

After the doctoral thesis has been accepted by the candidate's research advisor, a finished copy is presented to the Dean of the Graduate School, from whom it circulates to all members of the advisory committee. At a time convenient to all, the candidate shall then request a formal meeting of the advisory committee in order to secure approval of the dissertation. The dissertation must be approved by each member of the advisory committee.

Publication of the Dissertation

After the dissertation has been approved and accepted by the major department and by the advisory committee, two copies of the dissertation and two copies of an abstract must be submitted to the Graduate Council through the office of the Dean of the Graduate School. The major department may require a third copy for the department archives. Instructions on the final form of the dissertation are available at the office of the Director of Graduate Research.

The dissertation is published by University Microfilms, Ann Arbor, Michigan, and a fee of \$25.00 is charged to cover this expense. Upon certification by the student's committee and the Dean of the Graduate School, the typed first copy and an abstract not exceeding 600 words are forwarded to University Microfilms. (this abstract is in addition to the two copies of the abstract required for binding with the dissertation and must be carefully prepared for microfilming according to specifications set forth by the Director of Research). The manuscript is microfilmed, and the negative inspected and placed in vault storage. The manuscript is catalogued and this

information is sent to the Library of Congress for printing and distribution of cards to depository catalogues and libraries. The abstract is printed in the forthcoming issue of Doctoral Abstracts and distributed to leading libraries in this country and abroad, and to a selected list of journals and abstracting services. The first copy with one positive microfilm is then returned to the Rhodes R. Stabley Library on the University campus.

Re-examination

A student who fails the candidacy examination, or the comprehensive examination, or any of the language examinations, may present himself for re-examination not earlier than one semester later nor later than one year after the time of the first examination. No student will be allowed a third examination without a recommendation to that effect from the department in which he has done his major work and the approval of the Graduate Council.

Application for Graduation

Formal application for graduation must be filed with the Dean of the Graduate School not later than two months prior to the date of the University Convocation at which the candidate expects to receive the Doctor's degree.

DEPARTMENT CURRICULUMS, INSTRUCTIONS AND COURSE DESCRIPTIONS

ART

Lawrence F. McVitty, Chairman
Robert C. Seelhorst, Director of Graduate Studies

Barbara J. Balsiger	Robert W. Hamilton	Frank Ross
Vaughn H. Clay, Jr.	James M. Innes	Jean J. Slenker
Robert J. Cronauer	George B. Johnson	Robert E. Slenker
Thomas J. Dongilla	Joanne P. Lovette	Robert J. Vislosky
Anthony G. DeFurio	Benjamin T. Miller	
John J. Dropcho	Ralph W. Reynolds	

The graduate program directed toward a Master of Education Degree in Art assumes that the student has reached a point of desire to increase his abilities in his chosen field. The curriculum makes it possible for students to select a balanced program of professional studies combined with fine and applied arts and crafts. The student should analyze the requirements for the degree in connection with his own needs, selecting courses which will assist in making him a stronger person in his chosen profession. The student will select his advisor for his research area.

Students entering this program must have completed the undergraduate requirements for certification to teach art.

Advisory: Each student will plan his program with a graduate advisor, appointed upon the student's admittance to graduate study. The student must have the approval of his adviser of his program. Courses taken without the adviser's knowledge may not be counted for graduation and are taken at the student's risk. Because courses are offered on a rotation basis careful planning in advance is highly desirable.

Research: All proposals for the research requirements in the Art Department must have the approval of at least three members of the art faculty (usually the Art Department Graduate Committee and its chairman). The research is then carried on by the student with a research adviser, who does not need to be the program adviser.

ART

Curriculum for Master of Education Degree

Students working for this degree with a major in Art will complete the thirty (30) semester hours of work using the following outlines as a guide:

I. General Studies—Select four to six (4-6) semester hours from at least 2 areas. Other choices may be made with the approval of the adviser.

Bus	570	Economic Backgrounds of Business	2 s.h.
Eng	521	Mcderm European Fiction	2 s.h.
Eng	540	Twentieth Century American Drama	2 s.h.
Eng	535	Criticism	2 s.h.
Eng	531A	or B Major Writers	2 s.h.
Eng	523	The Development of Modern English	2 s.h.
Eng	536	Studies in Middle English and Renaissance Literature	2 s.h.
Eng	537	Modern American Fiction	2 s.h.
FL	521	Language and Society	2 s.h.
Math	521	Basic Concepts in Mathematics	2 s.h.
Mus	521	Music Literature and Materials	2 s.h.
Phil	581	Problems of Logic	2 s.h.
Phil	582	Problems of Ethics	2 s.h.
Phil	583	American Philosophic Thought	2 s.h.

SS	521	Contemporary American Issues	2 s.h.
SS	561	Social Policy Studies	2 s.h.

II. Subject Matter Concentration Area (14 to 22 s.h.)

A. Professional Studies (4 to 12 s.h.)

1. At least eight (8) semester hours in this section required for students seeking a Supervisor of Art certificate; otherwise, elect four (4) semester hours.

Art	510	Art and the Exceptional Child	2 s.h.
Art	511	Curriculum Development, Supervision, and Administration in Art	2 s.h.
Art	513	Research and Philosophy in Art Education (Prerequisite: Ed 515)	2 s.h.
Grad	550	Thesis	2-4 s.h.
Psy	531	Psychology of the Exceptional Child	2 s.h.

B. Fine and Applied Arts and Crafts (6 to 18 s.h.)

1. The Basis of Art in Culture (Elect 2 or more s.h.)

Art	522	Art in America	2 s.h.
Art	523	Seminar in Art Criticism	2 s.h.
Art	524	Art of the East	2 s.h.
Art	525	Architectural Influences in Contemporary Society	2 s.h.
Art	526	Exotic Art and Art of Latin America	2 s.h.
Art	527	Renaissance Art	2 s.h.
Art	528	World Art Since 1875	2 s.h.

2. Design (Elect 2 or more s.h.) Three clock hours are required to earn two semester hours. The student may elect three different courses or three courses in one field as indicated by Roman Numerals—for example, Graduate Studio in Ceramics I, II and III.

Art	540-541-542	Graduate Studio in Ceramics I, II, III	2-6 s.h.
Art	543	Exhibition Techniques	2 s.h.
Art	544-545-546	Graduate Studio in Fabrics I, II, III	2-6 s.h.
Art	547-548-549	Graduate Studio in Jewelry and Metal Work I, II, III	2-6 s.h.
Art	550-551-552	Graduate Studio in Sculpture I, II, III	2-6 s.h.
Art	553-554-555	Graduate Studio in Crafts I, II, III	2-6 s.h.
Art	556	Graduate Studio in Theater Arts or Dramatic Arts	2 s.h.

3. Graphic Design (Elect 2 or more s.h.) Three clock hours are required to earn two semester hours. The student may elect three different courses or three courses in one field as indicated by Roman Numerals.

Art	561	Graduate Studio in Drawing	2 s.h.
Art	562-563-564	Graduate Studio in Oil Painting I, II, III	2-6 s.h.
Art	565-566-567	Graduate Studio in Water Color Painting I, II, III	2-6 s.h.
Art	568-569-570	Graduate Studio in Print Making I, II, III	2-6 s.h.
Art	571	Graduate Studio in Mural Painting	2 s.h.

4. Directed Studies

Art	516	Directed Studies	2-4 s.h.
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III. Foundations of Education—select two (2) semester hours

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

IV. Research Techniques—two (2) semester hours are required. This course should be completed early in the student's program.

Grad	515	Elements of Research	2 s.h.
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Course Descriptions**Art 510 Art and the Exceptional Child**

2 s.h.

Recent trends in education have required more specific understanding of particular students. This course is designed to consider the characteristics and needs of the mentally retarded and the intellectually gifted child with particular emphasis on the art aspects of their education. (Vislosky, R. Slenker)

Art 511 Curriculum Development, Supervision, and**Administration in Art Education**

2 s.h.

This course offers a study of the organization, direction and supervision of programs of art education in grades 1-12, with emphasis placed on the administrative aspect. Curriculum development, scheduling, the selection, evaluation and requisitioning of art materials, guidance of art and classroom teachers (in-service training), multi-sensory materials, personnel selection, public relations and physical facilities are typical problems. (Lovette, Cronauer, McVitty)

Art 513 Research and Philosophy in Art Education**(Prerequisite: Grad 515)**

2 s.h.

This course will be required of all Art Education Majors. It will consider the history and philosophy of art education in Europe and America in order to shape concepts of the art program of the future. Opportunity will also be provided to review research related to the foregoing so that the student may define his own research problem or thesis. The prerequisite for this course, Grad 515, is to be scheduled within the first four to eight hours of graduate credit. Art 513 must be taken as soon thereafter as possible but within the first twelve hours of graduate credit. (McVitty, Seelhorst, Vislosky)

Art 516 Directed Studies

2-4 s.h.

This course is offered in instances where a particular course is needed by a student, but is not on the regular schedule rotation. Approval must be secured from the adviser, the instructor involved, and the Graduate Committee in Art Education.

Art 521 Contemporary Movements in Art

2 s.h.

Current philosophies and trends in fine arts and art education as they apply to human growth and development will be studied. Research and round table discussion of contemporary art forms will help the student to discover the concepts involved in art expression and how they evolved. (Non-Art Majors) (McVitty)

Art 522 Art In America

2 s.h.

This course surveys American art and its relation to the development of American ideas and ideals. (Seelhorst, Balsiger)

Art 523 Seminar in Art Criticism

2 s.h.

This course explores the various philosophic theories of art and art products. An attempt will be made not only to relate these theories to the senses and form itself, but also to technical, psychological, and cultural values. The primary concepts explored are play, illusion, imitation, beauty, emotional expression, imagination, empathy, creativity, and experience. Some time will be given to forms of art that are not primarily visual, including music, dance, literature and poetry. (Seelhorst)

Art 524 Art of the East

2 s.h.

The aspects of Eastern Art will be studied as to the nature of their origin, meaning, and place in contemporary world culture. (Clay)

Art 525 Architectural Influences in a Contemporary Society

2 s.h.

Architecture is studied in its relation to the needs of contempo-

rary life. Experimental problems in structure and aesthetics as related to architecture are explored. Attempts are made to search out the historical roots of many contemporary styles of architecture. (Seelhorst, R. Slenker)

Art 526 Exotic Art and Art in Latin America 2 s.h.

Not all cultures are of Graeco-Roman heritage. This course will be designed around the art of other cultures, sometimes called primitive, in order that we may recognize the nature of the artistic contribution of these peoples. (Clay)

Art 527 Renaissance Art 2 s.h.

This is the study of the great art achievements of the Renaissance in the fields of painting, architecture, sculpture, and the minor arts. Achievements in the humanities and their relationships are studied against the background of the social, economic and political developments of the era. (Balsiger, Innes)

Art 528 World Art Since 1875 2 s.h.

The ferment which began in the French Revolution and carried through World Wars I and II has been accompanied by similar revolutions and upheavals in human life and art. This course will consider the discoveries and advances in artistic expression in modern times. Subject matter for study may be found in any or all of the arts. (Seelhorst, Innes)

Art 540-541-542 Graduate Studio in Ceramics I, II, III 2-6 s.h.

These advanced courses in ceramics emphasize the total working process—the selection and preparation of clay bodies, manipulation of clay to achieve expressive form, exploration of decorative techniques. Acquiring familiarity with glaze materials and ability to formulate glazes, as well as control of the firing process, are requisites. Search for sources of equipment and supplies lead into the related aspects of studio planning. (Ross, McVitty, Dongilla)

Art 543 Exhibition Techniques 2 s.h.

Presenting works of art well has become the duty of many in the field of art. This course will consider the requirements of Museology as problems in the design of display installations. Field trips will be taken to museums in the area. (Lovette, R. Slenker)

Art 544-545-546 Graduate Studio in Fabrics I, II, III 2-6 s.h.

The fundamentals of fabric construction and some history of weaving processes are discussed. Warping, threading, and basic weaves will be included in Studio I.

Studio II and III will consider drafting and work on more complex harness looms. The experimental attitude will be maintained in all classes. (McVitty, J. Slenker)

Art 547-548-549 Graduate Studio in Jewelry and Metal Work I, II, III 2-6 s.h.

Advanced study dealing with specialized problems in the design and execution of metal work and jewelry. A thesis may be developed based upon research in one of the areas relating to this field, history, materials, tools, processes, or teaching techniques of the craft. (Cronauer, J. Slenker)

Art 550-551-552 Graduate Studio in Sculpture I, II, III 2-6 s.h.

This is an advanced course in which students are expected to work on more complex problems of sculpture. A student may explore one or several sculpture or modeling media. (Dongilla, Slenker, Visslosky)

Art 553-554-555 Graduate Studio in Crafts I, II, III 2-6 s.h.

Specialized study and experiences are related to the design and

execution of problems relating to wood as a crafts material. Opportunity is presented for more intensive exploration of the materials and processes of this craft employing both hand and power tools. (Dropcho, Cronauer)

Art 556 Graduate Studio in Theater Arts or Dramatic Arts 6 s.h.

Theory and application of the techniques of designing, building, and painting of stage settings; organization and operation of production crews. This is arranged with the regular Summer Theater Play Productions. (Dropcho, Ensley)

Art 561 Graduate Studio in Drawing 2 s.h.

Drawing as a language is the principle concern of this advanced course. The continued development of skill in communication and expression in all kinds of materials and media is an objective. The drawing as an intimate work of the artist will be stressed. (Reynolds, Innes, Miller)

Art 562-563-564 Graduate Studio in Oil Painting I, II, III 2-6 s.h.

Traditional and contemporary methods and techniques in the area of plastic painting media are experienced. Composition, in relation to the modern painters' problems, is stressed. Opportunity is presented for exploration and specialization in depth as well as breadth. (Cronauer, Reynolds, Miller)

Art 565-566-567 Graduate Studio in Water Color Painting I, II, III 2-6 s.h.

Painting in transparent water color, gouache, mixed media, and with new water soluble paints, such as casein and acrylic polymer tempera. Traditional, current and experimental approaches are pursued with emphasis on design and emotional content. (Reynolds, Cronauer)

Art 568-569-570 Graduate Studio in Print Making I, II, III 2-6 s.h.

This is a study on the graduate level of the modes, media, material, techniques and processes of the graphic arts and their use in expression. The student may concentrate on the intensive exploration of one media/in depth or explore a number of media for breadth of experience. (Johnson, Miller)

Art 571 Graduate Studio in Mural Painting 2 s.h.

In this course the individual student should acquire a working knowledge of the materials and processes employed in mural painting, such as fresco, encaustic, oil and mosaic. The historical development of the mural as an art form should be considered as to its influence upon, and reference to, the modern mural. (Cronauer, Seelhorst, Miller)

Art 512-515—These numbers will be reserved for seminars of visiting artists as announced.

BIOLOGY

Francis W. Liegey, Chairman
Walter W. Gallati, Director of Graduate Studies

Robert K. Alico	Leon J. Hue	Frederick G. Schrock
Thomas E. Conway	Jan G. Humphreys	Arthur G. Shields
William R. Forbes	Robert E. Merritt	Martin L. Stapleton
Louis L. Gold	James H. Miller	Henry H. Vallowe
Donald E. Hoffmaster	Jerry L. Pickering	Cyril J. Zenisek

REQUIREMENTS FOR ADMISSION TO THE BIOLOGY DEPARTMENT

The applicant must have completed the requirements for a Bachelor's degree from an accredited college or university which should include one year each of inorganic chemistry, organic chemistry, physics, and mathematics. Applicants with undergraduate deficiencies may be required to register for appropriate courses.

REQUIREMENTS FOR CANDIDACY FOR AN M.ED. OR AN M.S. IN BIOLOGY

The satisfactory completion of six (6) semester hours of graduate work in the biological sciences under the direction of the graduate committee. For the M.S. student these six hours must be in core courses.

The selection of an adviser, and, with the adviser's approval, a committee of at least two (2) additional faculty members to guide the candidate in completing a tentative program and selecting a thesis problem or a project.

An official application for admission to candidacy, including the tentative program which has been approved by the adviser, must be submitted to the Biology Department graduate committee.

Candidates are expected to maintain an average of not lower than B. Continuance in the graduate program for those receiving two (2) course grades below the minimum is contingent upon favorable review of the graduate committee.

CURRICULUM FOR THE MASTER OF EDUCATION DEGREE

Students working for this degree with a major in Biology will complete 30 semester hours of work in accordance with the following divisions:

I. Subject Matter Concentration—16-22 semester hours.

Bio 500	Special Studies	2-6 s.h.
Bio 522	Biometry	3 s.h.
Bio 526	Molecular Genetics	3 s.h.
Bio 530	Instrumentation	3 s.h.
Bio 533	Biological Literature	2 s.h.
Bio 536	Comparative Plant Morphology	3 s.h.
Bio 540	Protozoology	3 s.h.
Bio 545	Microtechnique	2 s.h.
Bio 546	Dendrology	3 s.h.
Bio 548	Plant Ecology	3 s.h.
Bio 551	Taxonomy of Plants	3 s.h.
Bio 553	Prin. of Animal Taxonomy	2 s.h.
Bio 554	Advanced Ornithology	3 s.h.
Bio 556	Animal Ecology	3 s.h.
Bio 557	Animal Morphogenesis	3 s.h.
Bio 558	Endocrinology	4 s.h.
Bio 559	Advanced Entomology	3 s.h.

Bio	560	Herpetology	3	s.h.
Bio	562	Animal Physiology	4	s.h.
Bio	563	Physiology of Plants	4	s.h.
Bio	566	Cellular Physiology	4	s.h.
*Bio	568	Biology Practicum	2	s.h.
Bio	575	Mammalogy	3	s.h.
Bio	576	Radiation Biology	3	s.h.
Bio	578	Mycology	3	s.h.
Bio	580	Parasitology	3	s.h.
Bio	581	Microbial Physiology	4	s.h.
Bio	582	Pathogenic Microbiology	3	s.h.
Bio	583	Immunology	3	s.h.
Bio	586	Taxonomy & Ecology of Bacteria	3	s.h.
Bio	612	Biology Seminar II	1	s.h.
Chem	651	Biochemistry	3	s.h.
Geol	570	Paleontology	2	s.h.

*Strongly recommended for, and restricted to, M.Ed. students.

II. Professional Studies—4-10 semester hours of work, including Research Paper or Thesis, to be selected from the following:

LRes	500	Seminar in Learning Resources	2	s.h.
Psy	531	Psychology of the Exceptional Child	2	s.h.
Psy	532	Studies in Pupil Adjustment	2	s.h.

III. Foundations of Education—2 semester hours of work to be selected from the following courses:

Ed	511	Historical Foundations of Education	2	s.h.
Ed	512	Philosophical Foundations of Education	2	s.h.
Ed	513	Social Foundations of Education	2	s.h.

IV. Research Requirement—this course is required and should be scheduled early in the program in order to give the student ample time to fulfill the research requirement.

Bio	600	Methods of Research in Biology	2	s.h.
Every candidate must present a research thesis for credit or a non-credit research project on a topic approved by his adviser.				
Grad	550	Thesis	2-4	s.h.

CURRICULUM FOR THE MASTER OF SCIENCE DEGREE

Core Courses

Eighteen to twenty (18-20) semester hours selected from the following:

Instrumentation (Bio 530)	.....	3	s.h.
One Morphology Course (Bio 536, 546, 557, or 559)	.....	3	s.h.
One Physiology Course (Bio 562, 563, 566, or 581)	.....	4	s.h.
One Ecology Course (Bio 548, 556, or 586)	.....	3	s.h.
Methods of Research in Biology (Bio 600)	.....	2	s.h.
Seminar (Bio 612)	.....	1	s.h.
Thesis (Grad 550)	.....	2-4	s.h.

Elective Courses

Ten to twelve (10-12) semester hours of courses to be selected with the approval of the adviser from the areas listed below or from related science and mathematics courses.

General Courses

Bio	500	Special Studies	2-6	s.h.
Bio	522	Biometry	3	s.h.
Bio	526	Molecular Genetics	3	s.h.
Bio	533	Biological Literature	2	s.h.
Bio	545	Microtechnique	2	s.h.
Bio	566	Cellular Physiology	4	s.h.

Bio	576	Radiation Biology	3 s.h.
Chem	651	Biochemistry	3 s.h.
Geol	570	Paleontology	3 s.h.

Botany Courses

Bio	536	Comparative Plant Morphology	3 s.h.
Bio	546	Dendrology	3 s.h.
Bio	548	Plant Ecology	3 s.h.
Bio	551	Taxonomy of Plants	3 s.h.
Bio	563	Physiology of Plants	4 s.h.
Bio	578	Mycology	3 s.h.

Zoology Courses

Bio	540	Protozoology	3 s.h.
Bio	553	Principles of Animal Taxonomy	2 s.h.
Bio	554	Advanced Ornithology	3 s.h.
Bio	556	Animal Ecology	3 s.h.
Bio	557	Animal Morphogenesis	3 s.h.
Bio	558	Endocrinology	4 s.h.
Bio	559	Advanced Entomology	3 s.h.
Bio	560	Herpetology	3 s.h.
Bio	562	Animal Physiology	4 s.h.
Bio	575	Mammalogy	3 s.h.
Bio	580	Parasitology	3 s.h.

Microbiology

Bio	581	Microbial Physiology	4 s.h.
Bio	582	Pathogenic Microbiology	3 s.h.
Bio	583	Immunology	3 s.h.
Bio	586	Taxonomy and Ecology of Bacteria	3 s.h.

Resident Requirements for the M.S.:

The candidate must be in residence for at least seven (7) consecutive months of full-time work or the equivalent as determined by the candidate's advisory committee.

Research Requirements for the M.S.:

Every candidate must schedule Methods of Research in Biology (Bio 600) as part of his research requirement. This should be done early in his program.

Every candidate must present a research thesis on an original topic approved by the candidate's advisory committee. This is programmed as Grad 550 (thesis) for 2 to 4 credits.

Requirements for Completion of the M.S.:

1. (a) All students entering the M.S. program in the Biology Department must pass a comprehensive examination administered by the department graduate committee. The purpose of this examination is to assure that all of our graduates have a well proportioned knowledge of the field of Biology. The examination will also help point out the student's major areas of inadequate knowledge or training.
 - (b) This examination is offered at a specified time twice each year (toward the middle of each semester). Any time after the first semester of graduate studies, the student may signify his intentions of taking the examination by informing the graduate committee.
 - (c) This will be the only comprehensive examination for the Master of Science degree.
2. After the thesis has been accepted in its final written form by the candidate's committee and the Graduate School, the candidate is expected to present a public seminar covering the major areas of his research.

Course Descriptions

In many courses in the Biology Department, additional laboratory time may be required beyond the regularly scheduled periods.

Bio 500 Special Studies

2-6 s.h.

This course will consist of semi-independent studies under the guidance of an instructor. Maximum credit in any one area is six (6) semester hours. Time and class hours will be arranged by the instructor involved. Prerequisite: Permission of the instructor.

Bio 522 Biometry

3 s.h.

This course is designed to acquaint the student with the kinds and treatment of biological data. The application of mathematical principles in the treatment of these data will be stressed rather than a theoretical development of the mathematical concepts. Data will be analyzed from representative measuring instruments, e.g. spectrophotometry, manometry, linear measurement, etc.

Bio 526 Molecular Genetics

3 s.h.

Molecular genetics is a study of the chemical structure of the gene in relation to its molecular function in the control of specific protein biosynthesis. Emphasis will be placed on genetic systems of bacteria, fungi, and viruses.

Bio 530 Instrumentation

3 s.h.

An introduction to instrumental technique designed to aid in the development of skills employed in biological research.

Bio 533 Biological Literature

2 s.h.

The purpose of this course is to give the graduate student an opportunity to become more familiar with biological literature and to develop skill in the use of the literature. Periodicals, encyclopedias, handbooks, abstracting journals and other books dealing with the various divisions of biology will be studied. Students are required to conduct a literature search on a selected topic.

Bio 536 Comparative Plant Morphology

3 s.h.

A discussion of the procedures, general principles and objectives of comparative plant morphology. Emphasis will be placed on the relationships between morphology, taxonomy and experimental morphogenesis in the vascular plants.

Bio 540 Protozoology

3 s.h.

An introductory course which covers the common and representative genera of all groups of free-living protozoa (parasitic forms are not included). Major emphasis is placed upon the structure, physiology, ecology and life histories of these organisms. Laboratory work covers these same topics and an independent research project is required.

Bio 545 Microtechnique

2 s.h.

A course designed to acquaint the student with the procedures involved in the production of microscope slides. Techniques of preparing whole mounts, microtome sections and serial sections will be covered. Both plant and animal materials will be used. A one-semester course that will meet three hours per week, at least two of which will be spent in independent slide preparation. Prerequisites: General Biology I, II.

Bio 546 Dendrology

3 s.h.

A study of the woody plants as to their identification, distribution, ecology, culture, anatomy, physiology, mensuration and utilization.

Bio 548 Plant Ecology**3 s.h.**

The nature and distribution of vegetation in relation to environmental factors. Field investigations of local plant communities constitute the bulk of the laboratory work. Prerequisite: field botany, plant taxonomy or a general knowledge of local flora.

Bio 551 Taxonomy of Plants**3 s.h.**

This course includes the collection, identification, and classification of vascular plant species with special emphasis on family characteristics and phylogeny. Three hours per week throughout the year. Prerequisite: Botany I, II.

Bio 553 Principles of Animal Taxonomy**2 s.h.**

This course is a study of the classification system and its application to the identification of animals. The basic principles of taxonomy, rules of nomenclature, a synoptic history of classification and the "old" and "new" taxonomy will be included. A field study or original library project on some taxonomy problem is required.

Bio 554 Advanced Ornithology**3 s.h.**

This course will consist of a detailed study of bird populations, behavior, and movement including the annual cycle. Prerequisites: identification by site and song of local birds.

Bio 556 Animal Ecology**3 s.h.**

A course including the study of the effect of environmental factors on animals, animals as members of communities, their trophic relationships, their ecologic distribution, population dynamics, and aspects of animal behavior. A field or laboratory problem involving some aspect of animal ecology is required.

Bio 557 Animal Morphogenesis**3 s.h.**

Factors that influence and control the differentiation of organs, tissues, and cells are considered. Emphasis is placed on experimental procedures and methods. Prerequisites: Embryology or Comparative Anatomy, Organic Chemistry or Biochemistry, and Genetics.

Bio 558 Endocrinology**4 s.h.**

A study of the organs of internal secretion from the standpoint of their phylogeny, embryology, micro-anatomy, and physiology. Prerequisites: a course in anatomy and a course in physiology.

Bio 559 Advanced Entomology**3 s.h.**

The study of insect morphology including the external and internal organization of specimens of different species of insects. Comparisons and contrasts among species will be included as well as the relationships of social insects and their adaptations. Prerequisites: Biology 262.

Bio 560 Herpetology**3 s.h.**

This course provides a comprehensive survey of the classes Amphi-bia and Reptilia. Topics for study include the classification, structure, origin, evolution, phylogenetic relationships, distribution, and natural history of amphibians and reptiles. Special emphasis is placed on the herpetofauna of Pennsylvania.

Bio 562 Animal Physiology**4 s.h.**

Through lectures and laboratory work, students will consider the events of digestion, molecular transport of nutrients and wastes, gaseous exchange, excretion, muscular movement, and control by endocrines and nervous tissue. Prerequisites: Zoology I, II.

Bio 563 Physiology of Plants**4 s.h.**

A comprehensive study is made of the physical and chemical bases for the organization and operation of living plant systems. Water relations, in organic plant nutrition, intermediary metabolism,

photosynthesis, growth, reproduction, tropisms, vernalization, and photoperiodism are among the areas considered. Prerequisites: General Biochemistry. May not be programmed by students with undergraduate credit for Biol. 351, Plant Physiology.

Bio 566 Cellular Physiology

4 s.h.

A study of the fundamental activities of plants, animals and microorganisms. The activities considered include the following: nutrition, including in its broadest sense the uptake and preparation of food and oxygen, the release of energy and elimination of waste products; response to the environment; and growth and reproduction.

Bio 568 Biology Practicum

2 s.h.

This course is designed to convey to the high school biology teacher the knowledge of the preparation of culture media and solutions. Problems and techniques unique to the biological sciences with respect to demonstration material, handling and housing of plants and animals, safety in the laboratory and in the field, and the maintenance of equipment will be discussed. Theoretical and practical work will be done with the development of on-going experiments and research projects. Handbooks and other resource materials useful in the "laboratory approach" to biology will be given special attention.

Bio 575 Mammalogy

3 s.h.

This is an introduction to the classification of mammals of North America and a review of the life histories of representatives of the various orders. Laboratory work will deal with the identification of local species and the standard procedures for collection and preservation of mammals. Two hours lecture and three hours laboratory work per week.

Bio 576 Radiation Biology

3 s.h.

Basic aspects of nuclear physics, the phenomena of radioactive isotopes and the biological effects of such isotopes. Concurrent laboratory work utilizing instruments for detection and measurement of radioactive nuclides used in biological experimentation. Meets three hours per week in a combined lecture-laboratory period. Organic and biological chemistry strongly recommended.

Bio 578 Mycology

3 s.h.

A study of the systematics, morphology, and physiology, with emphasis on economically important and experimentally useful Myxomycophyta and Eumycophyta. Laboratory studies will include exercises in the physiology and genetics of fungi and the collecting, culturing and identifying of representative species. May not be programmed by students with undergraduate credit for Biol. 381, Mycology.

Bio 580 Parasitology

3 s.h.

An introductory course which covers the parasitic protozoa, flatworms and roundworms. Major emphasis is placed upon species infesting man and includes their structure, physiology, ecology, life cycles, pathogenicity and treatment. Laboratory work includes some dissection of vertebrate hosts and fixing, staining and mounting of any parasites recovered. Arthropods involved in parasite transmission are also included. Prerequisites: one year Biology, Vertebrate and Invertebrate Zoology.

Bio 581 Microbial Physiology

4 s.h.

A study of the physiological reactions involved in the growth, reproduction and death of microbes. Special consideration will be placed upon the metabolism of carbohydrates, proteins, vitamins and

fats. Enzymes, oxidation-reduction potentials, energy relationships, membrane potentials and required nutrients will also be considered. Prerequisite: Chem 361 and Bio 361 (or equivalent).

Bio 582 Pathogenic Microbiology 3 s.h.

A study of diseases caused by microorganisms with emphasis on human pathogens. Consideration is given to both the epidemiology and aspects of the host-parasite relationships. The laboratory stresses methods of isolation and identification of pathogens. Prerequisites: Biol 361 or equivalent.

Bio 583 Immunology 3 s.h.

A study of the physical and chemical properties of antigens and antibodies; the nature of antigen-antibody interactions; the mechanism of antibody formation; and the immune reaction in disease. The laboratory will employ serological techniques. Prerequisites; Bio-chemistry and Microbiology.

Bio 584 Soil Microbiology 3 s.h.

A survey of the nature and abundance of microorganisms in the soil. The important role that microorganisms play in soil processes and soil fertility will also be considered.

Bio 586 Taxonomy and Ecology of Bacteria 3 s.h.

A study of the isolation, cultivation, classification and ecology of the major groups of bacteria. Special emphasis is given to the principles of bacterial taxonomy and ecology.

Bio 600 Methods of Research in Biology 2 s.h.

This course gives the student a background in selecting a research project or thesis problem in either biological or related educational areas, and provides assistance in collecting and analyzing data. The format of the AIBS style manual will be followed in both project and thesis writing. One hour meeting per week. Required for M.Ed. and M.S. candidates as a part of the research methods requirement. (Staff)

Bio 612 Biology Seminar 1 s.h.

This seminar gives the student an opportunity to become acquainted with the various areas of current research in biology. One hour meeting per week. Required for M.S. candidates and optional for M.Ed. candidates. (Staff)

Mar. Sci. 500 Problems in Marine Science 3 s.h.

A course in independent study for the advanced student in marine sciences. Topics are selected from the areas offered by the Marine Consortium and the studies are directed by the instructor in that area. Prerequisite: Consent of Instructor.

BUSINESS EDUCATION

J. K. Stoner, Chairman
A. E. Drumheller, Dean, School of Business

Lee R. Beaumont
Charles L. Cooper
Elsie M. Hileman
Patricia L. Patterson

John A. Polesky
Leslie S. Spencer
Harold W. Thomas
Dale W. Woomer

The graduate program in Business Education at Indiana is primarily designed to permit the student to broaden his understanding of the business world and to study his teaching procedures in the light of new experiences.

Upon admission to the Graduate School each student is tentatively assigned an adviser. The adviser assists the student in scheduling his program of studies. If the tentative assignment is mutually agreeable to the student and the adviser, the arrangement is continued.

A review of the present curriculum would indicate that from fourteen to sixteen credit hours are to be taken in a subject matter concentration area. Students should select courses in the basic business area along with courses from at least one of the areas concerned with either accounting, secretarial or marketing. The two courses which all degree candidates shall schedule prior to Grad 515, Elements of Research are Bus 510, Business Communications and Report Writing and Bus 522, Seminar in Business Education. Grad 515, Elements of Research, must be taken by the time the student has earned twelve semester hours credit.

Courses in the subject matter concentration area should be scheduled early, making use of those courses in the general studies and foundations of education areas as they can be fitted into one's schedule as the work progresses.

Prior to his admission to candidacy for the degree, (see p. 37) all business students must take the Admission Test for Graduate Study in Business which is a part of the Graduate Record Examination. Information about this examination can be obtained from the advisers or the Graduate office.

BUSINESS

Curriculum for Master of Education Degree

I. General Studies—four to six (4-6) semester hours of work to be selected from the following:

Art	521	Contemporary Movements in Art	2 s.h.
Eng	521	Modern European Fiction	2 s.h.
Eng	523	The Development of Modern English	2 s.h.
Geog	521	Advanced Human Geography	2 s.h.
Math	521	Basic Concepts in Mathematics	2 s.h.
Phil	581	Problems of Logic	2 s.h.
Phil	582	Problems of Ethics	2 s.h.
Phil	583	American Philosophic Thoughts	2 s.h.
SS	521	Contemporary American Issues	2 s.h.

II. Subject Matter Concentration Area—fourteen to sixteen (14-16) semester hours work in subject matter content to be selected from the following:

A minimum of two areas are to be chosen.

A. Accounting—Prerequisite of twelve hours in Accounting

Bus	500	Accounting Systems	2 s.h.
Bus	501	Principles of Tax Accounting	2 s.h.
Bus	502	Advanced Tax Accounting	2 s.h.

Bus	503	Financial Statement Analysis	2 s.h.
Bus	504	Budgeting and Cost Analysis	2 s.h.
Bus	505	Advanced Accounting	2 s.h.
Bus	506	Interpretation of Accounting Data (for Non-Business Majors and Non-Accounting Business Students)	2 s.h.
B. Secretarial—Prerequisite of nine hours in Shorthand			
Bus	512	Office Organization and Management	2 s.h.
Bus	513	Foundations of Teaching Bus. Skills	2 s.h.
Bus	514	Executive Secretarial Training	2 s.h.
C. Marketing			
Bus	520	Retail Organization and Management	2 s.h.
Bus	521	Principles of Marketing	2 s.h.
Bus	522	Sales Promotion and Advertising	2 s.h.
Bus	523	Marketing Research	2 s.h.
D. Basic Business			
Bus	510	Business Communications and Report Writing	2 s.h.
Econ	525	Money and Banking	2 s.h.
Bus	531	Principles of Investment in Securities	2 s.h.
Bus	532	Current Business Economic Problems	2 s.h.
Bus	533	Case Problems in Business Law	2 s.h.
Bus	534	Consumer Economic Problems	2 s.h.
Bus	536	Automated Data Processing I	4 s.h.
Bus	537	Automated Data Processing II	4 s.h.
Bus	540	Office or Retail Work Experience	4 s.h.
Bus	541	Principles of Management	2 s.h.
Bus	542	Human Relations in Business	2 s.h.
Bus	543	Leadership Development in Business and Distributive Education	2 s.h.
III. Professional Studies—six to ten (6-10) semester hours including a research project:			
A. General Area			
Bus	550	Principles and Problems of Business Education	2 s.h.
Bus	551	Administration and Supervision of Business Education	2 s.h.
Bus	552	Seminar in Business Education	2 s.h.
Bus	553	Supervision of Business Vocational Education	2 s.h.
Grad	516	Statistical Methods I	2 s.h.
Grad	550	Thesis	2-4 s.h.
B. Instructional Area—a minimum of two semester hours			
Bus	560	Improvement of Instruction in Secretarial Courses	2 s.h.
Bus	561	Improvement of Instruction in Basic Business Courses	2 s.h.
Bus	562	Improvement of Instruction in Bookkeeping and Business Arithmetic	2 s.h.
Bus	563	Improvement of Instruction in Office Practice	2 s.h.
IV. Foundations of Education—two (2) semester hours of work select- ed from:			
Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.
V. Research Techniques—the following course is required. It should be scheduled early in the student's program:			
Grad	515	Elements of Research	2 s.h.

Course Descriptions**Bus 500 Accounting Systems****2 s.h.**

A study of the accounting principles as applied in constructing accounting systems. Special attention will be given to the problems of management as they relate to accounting systems. This is to be done with the idea of building a system to give management the information desired for effective operation of the business. (Stoner)

Bus 501 Principles of Tax Accounting**2 s.h.**

The fundamentals of Federal Income Tax Accounting are presented under the latest amendments to the Internal Revenue Code. The various income tax blanks and forms are presented and filled in with special emphasis upon the returns of individuals, single proprietorships and partnerships. Students who completed Bus 454 - Tax Accounting should not program this course. (Drumheller)

Bus 502 Advanced Tax Accounting**2 s.h.**

This course is designed to give the student further familiarity with the Federal Income Tax law with emphasis upon the law concerning corporate returns, estates and trusts, federal estate tax and gift tax. Bus 501, or its equivalent, is a prerequisite to taking this course. (Drumheller)

Bus 503 Financial Statement Analysis**2 s.h.**

This course is designed to give a detailed analysis and interpretation of financial statements with advanced problems supporting the theory presented. Particular types of statements as they apply to public utilities, industrials, and moneyed corporations are introduced. (Stoner)

Bus 504 Budgeting and Cost Analysis**2 s.h.**

The preparation and use of flexible expense budgets; the establishment of production cost standards and the analysis of cost variances; extensive analysis of cost control and profit planning programs; and direct costing. Prerequisite: Elementary Cost. (Cooper)

Bus 505 Advanced Accounting**2 s.h.**

This course is designed to emphasize the specialized phases of accounting, such as joint ventures and syndicates, installment sales, consignments, domestic agencies and branches, consolidated statements, and application of funds statements. (Cooper)

Bus 506 Interpretation of Accounting Data**2 s.h.**

This is an accounting course for non-accounting students. It is designed to provide an understanding of accounting data from the viewpoints of management, investors, or potential investors. "How to do accounting" is not a prerequisite and is not an objective of this course. (Cooper)

Bus 510 Business Communications and Report Writing**2 s.h.**

A study and comparison of effective written communications. Emphasis on the positive approach, clear statements, and good form and structure. The organization and preparation of reports of the types used in education, business and government. Techniques of collecting, interpreting, and presenting information useful to executives will be studied. (Hileman)

Bus 511 Advanced Shorthand for Teachers (deleted, see Bus 513)**Bus 512 Office Organization and Management****2 s.h.**

Duties and responsibilities of the office manager; principles of practical office management and their application. Includes survey and analysis development of manuals and their use; selection, training, pay and promotion of office employees; controlling expense and measuring office efficiency; quality and quantity standards; purchase and use of equipment; and report writing. (Hileman)

Bus 513 Foundations of Teaching Skills in Secretarial Courses 2 s.h.

This course is designed to increase a student's background and knowledge of business skill subjects, with primary emphasis on shorthand and typewriting. Through discussion and research, students explore the rationale and psychological bases of skill development as they apply to the techniques and devices utilized in teaching business courses. (Beaumont)

Bus 514 Executive Secretarial Training 2 s.h.

This course for teachers will stress the application of secretarial skills and knowledges and emphasize the importance of good human relations in the office. The course will show ways to complement the secretarial training so that high school graduates may become competent, proficient, and well-adjusted secretaries. (Hileman)

Bus 520 Retail Organization and Management 2 s.h.

This course will be directed toward the many problems of retail management. It will include a study of the present day trends in retailing, personnel management, merchandise control, pricing, promotion, services, accounting, and expense control. (Thomas)

Bus 521 Principles of Marketing 2 s.h.

A study of the risks, costs, and methods in the distribution of goods of farm and industry. A comprehensive analysis of such problems as research, competition, pricing, and laws in marketing goods from the manufacturer or producer to the consumer. (Thomas)

Bus 522 Sales Promotion and Advertising 2 s.h.

An introduction to the basic principles of sales promotion and advertising together with a consideration of the major problems encountered in the management of these activities. Major emphasis is placed on the determination of basic promotional strategy; selection of advertising media; determining the advertising appropriations; and advertising research. Advertising is discussed as an institution performing basic social and economic functions. (Thomas)

Bus 523 Marketing Research 2 s.h.

A study of research procedures and techniques applicable to problem solving in the field of marketing. A critical analysis of research techniques with considerable emphasis placed on orienting the student to the use of information gathered. Prerequisite: Marketing. (Staff)

Econ 525 Money and Banking 2 s.h.

The course is offered in the Economics Department.

Bus 531 Principles of Investment in Securities 2 s.h.

It is the purpose of this course to familiarize the student with the many forms of investment possibilities which exist. Attention will be given to the operation of the stock markets, concepts and terminology of investing, mutual funds and their function, investment clubs and the problems involved in making investments through brokers, bankers, and stock promoters. (Cooper)

Bus 532 Current Business Economic Problems 2 s.h.

Selected economic problems of current interest and concern to society will be analyzed. An examination will be made of basic economic principles and theories as well as the thinking of recognized economists in connection with the problems studied. (Beaumont)

Bus 533 Case Problems in Business Law 2 s.h.

It is to be assumed that the student has a knowledge and background of the theory of business law prior to taking this course. The course deals with the solution of case problems as applied to the various topics in the field of business law. (Woomer)

Bus 534 Consumer Economic Problems

2 s.h.

A program for the education of intelligent consumers is planned for this course. How to gain the maximum satisfaction from goods and services available to the consumer is an important consideration. An effort will be made to develop an appreciation of the problems of the producer, distributor as well as those of the consumer. (Polesky)

Bus 536 Automated Data Processing I

4 s.h.

This course covers the theory and operation of automated data processing equipment. Input devices will include the key punch, paper tape punch and the keyboard to magnetic tape equipment. Semi-automatic accounting machines and ledger posting devices will be studied. The output devices such as the reader-punch, reproducer, interpreter and other equipment will be covered. 2 hr. lecture and 2 hr. lab. Prerequisite: Certificate to teach. (Spencer)

Bus 537 Automated Data Processing II

4 s.h.

This course will develop the principles of Assembler Language Programming with specific applications for the teachers of business and distributive education. The course will be built upon the basic concepts of data processing developed in BUS 536. Special emphasis will be placed on computer based instruction and programmed instruction as used with the console typewriter and remote terminals. The value of library programs will be demonstrated. 2 hr. lecture and 2 hr. lab. Prerequisite: Certificate to teach and BUS 536 or its equivalent. (Spencer)

Bus 549 Office or Retail Work Experience

4 s.h.

The graduate student who has not had extensive business experience is given the opportunity to work full-time for six weeks during the summer in a business position under the supervision of the college. Evening seminars will be held weekly to discuss problems related to the work experience program. A written report of the experience will be required. (Staff)

Bus 541 Principles of Management

2 s.h.

The course is a study of the development, nature, and meaning of the basic functions of management. Emphasis will be placed upon the functional principles involved in planning, organizing, and controlling the activities of an organization at all levels of management. The application of these principles in the general areas of production, marketing, finance, and personnel will be analyzed. (Patterson)

Bus 542 Human Relations in Business

2 s.h.

Human motivations and their constructive application to all aspects of business form the central theme of this course. The psychological basis of human relations will be developed as it applies in the business world. Major topics include employer-employee relations, labor relations, stockholder relations, customer relations, community relations, and public relations. (Thomas)

Bus 543 Leadership Development in Business and Distributive Education

2 s.h.

This course will include methods, procedures and programs for developing leadership in teachers and teacher-coordinators of secondary, post secondary and adult programs in business and distributive education. There will be emphasis on the coordination of activities of school and business working with community leaders in developing and maintaining an effective vocational business program. The promotion and development of youth groups will be an important objective of this course. (Beaumont)

Bus 550 Principles and Problems of Business Education

2 s.h.

The purpose of this course is to survey the basic principles and practices of business education. Among the topics considered are:

history of the high school business program, purposes, attitudes of management and labor toward education, the relationship of general education to business education, and trends in the field. (Stoner)

Bus 551 Administration and Supervision of Business Education 2 s.h.

This course offers an opportunity to study the problems of organizing, directing, and supervising business education programs. Such matters as the functions of the administrator and supervisor of business education, textbook selection, teacher selection, testing programs, conferences, equipment and layout are considered. (Drumheller)

Bus 552 Seminar in Business Education 2 s.h.

This course is devoted to a critical examination and evaluation of current literature and research in business education. The graduate student is expected to conduct an extensive study of literature representative of the entire field of business and an intensive study in one or more specialized areas compatible with his professional interests and activities. Investigation of procedures used in current and outstanding research studies is emphasized. (Beaumont and Woomer)

Bus 553 Supervision of Business Vocational Education 2 s.h.

This course offers an opportunity to study the problems of organizing, directing, and supervising a vocational education program in business. Special emphasis will be placed on the implementation of programs in distributive and office education as proposed under the various Vocational Arts. (Hill)

Bus 560 Improvement of Instruction in Secretarial Courses 2 s.h.

A course for experienced business teachers. Teaching procedures basic to the development of vocational proficiency in shorthand, typewriting, and transcription including: content; methods; teaching aids; available instructional materials; measurement of skills; and standards of achievement. (Hileman)

Bus 561 Improvement of Instruction in Basic Business Courses 2 s.h.

This course is designed for experienced classroom teachers and for prospective teachers specializing in the basic business subjects. It deals with the aims of business education; its relation to vocational and general education; available instructional materials; curricular organization; teaching aids and devices; techniques for improving instruction; and other teaching problems of such subjects as junior business training or general business, economic geography, business law, consumer education, salesmanship, and business economics. (Polesky)

**Bus 562 Improvement of Instruction in Bookkeeping
and Business Arithmetic 2 s.h.**

A study of problems and techniques in the teaching of bookkeeping and arithmetic for experienced and prospective business teachers. Topics include: objectives; the place of bookkeeping and arithmetic in the curriculum; planning for teaching; techniques for improving instruction; resource materials; standards; construction of courses to meet special needs; the use of practical sets; testing and grading; and visual aids. Teaching problems of students will be emphasized. (Stoner)

Bus 563 Improvement of Instruction in Office Practice 2 s.h.

This course is designed to provide business teachers with a working philosophy and practical approach to the teaching of office machines and equipment in the secondary schools and community colleges. Through readings and discussions, the student will develop plans and techniques for implementing office practice courses. "Hands-on" experience in the use of a variety of modern office equipment will be provided. (Patterson)

Bus 570 Economic Backgrounds of Business**2 s.h.**

This course is designed to provide a thorough overview of the economic environment in which business and other agencies must operate. The student will gain a broad perspective of business operations through such topics as business organization and management, consumption of goods, business risks, business cycle, budgeting and investments. This course is not open to Business Education Majors, but is designed for a general studies course in the Elementary and other programs. (Polesky and Stoner)

DEPARTMENT OF CHEMISTRY

Paul R. Wunz, Jr., Chairman

Carl W. Bordas
 Edward N. Brown
 Nicholas D. Christodouleas
 Edward G. Coleman
 Joseph J. Costa
 Frank Fazio
 Richard A. Hartline

William I. Heard
 Richard W. Kolaczkowski
 Ronald L. Marks
 Donald R. McKelvey
 Robert A. Patsiga
 Augusta Syty
 Stanford L. Tackett

Donald N. Zimmerman

The chemistry department offers both the Master of Education and the Master of Science degree in chemistry. Each program is designed to meet the specific needs of the persons enrolled in the programs.

The Master of Education program is designed for the secondary school teacher. It is the purpose of this program to afford the teacher the opportunity to increase his knowledge of chemistry and keep abreast of a rapidly changing field. The major emphasis is on subject matter.

The Master of Science degree is for the chemist who intends to pursue further graduate work leading to a Ph.D. or who intends to work as a professional chemist and desires to become more competent in chemistry. This degree is research oriented and successful completion of an experimental thesis is required.

Four core courses, one in each of the areas of inorganic, organic, analytical, and physical chemistry, are required in both the M.Ed. and the M.S. degree programs. Beyond this point the two programs separate with the M.S. student taking more specialized work in chemistry along with an experimental research problem, while the M.Ed. candidate will take broadening courses which will make him a more effective teacher.

Curriculum for Master of Education Degree in Chemistry

Students planning to complete this program should have one year each of General Chemistry, Analytical Chemistry, Organic Chemistry, Physical Chemistry, and General Physics, as well as Mathematics through Integral Calculus.

Students working for this degree with a major in Chemistry will complete a minimum of thirty (30) semester hours of work in accordance with the following divisions:

I. Subject Matter Concentration Area—twenty to twenty-two (20-22) semester hours of work as follows.

A. Required Courses

Chem 610	Inorganic Chemistry (Core Course)	3 s.h.
Chem 620	Analytical Chemistry (Core Course)	3 s.h.
Chem 630	Organic Chemistry (Core Course)	3 s.h.
Chem 640	Physical Chemistry (Core Course)	3 s.h.

B. Elective Chemistry Courses—eight to ten (8-10) semester hours of work elected from the following courses:

Chem 505	Chemical Systems	2 s.h.
Chem 506	Chemistry, An Experimental Science	2 s.h.
Sci 572	Experimental Techniques in Chemistry and Physics	2 s.h.
Chem 602	Chemistry in Manufacturing Processes	2 s.h.
Chem 522	Advanced Instrumental Methods of Analysis	2 s.h.
Chem 546-547	Biochemistry I and II	2 s.h./sem.
Chem 576	Radiochemistry	2 s.h.

II. Foundations of Education—two (2) semester hours.

One course must be selected from these offerings:

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

III. Research Requirements—two to six (2-6)* semester hours.

A thesis or research project is required of each student. The thesis may earn from two to four semester hours credit.

Grad	550	Thesis and Research	2-4 s.h.
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*A research project fulfills this requirement, but does not earn any semester hour credit.

Grad	515	Elements of Research or	
Chem	533	Chemical Literature	2 s.h.

IV. Non-Chemistry Electives—zero to six (0-6) semester hours.

The student may complete the thirty (30) semester hour requirement by choosing from among any of the non-chemistry offerings of the Graduate School with the advice and approval of his graduate adviser. The student must satisfy any stated prerequisites for the elective courses.

Curriculum for Master of Science Degree in Chemistry

Admission requirements: (1) a Bachelor's degree from an accredited college or university and an undergraduate grade point average of 2.5 or better; (2) satisfactory scores on the advanced test in chemistry in the Graduate Record Examination, which results are used for determining deficiencies and for planning the student's program; (3) acceptance by the Chemistry Department M.S. committee.

Requirements for Candidacy for the M.S. in Chemistry: The following requirements must be met by a student before he can become a candidate for a M.S. degree in chemistry:

- (1) Submit an official application for admission to candidacy.
- (2) Submit a transcript of graduate work completed at other institutions.
- (3) Complete at least six (6) semester hours of graduate work at Indiana in courses designated by 600 chemistry numbers, not including thesis and research.
- (4) Receive satisfactory course evaluation from graduate instructors.
- (5) Submit a tentative program of study for the completion of the graduate program.

Residence Requirements: The student shall be in residence two (2) consecutive semesters of full-time work or the equivalent, as determined by the student's supervisory committee.

Course Requirements*

(1) Core Curriculum—Fourteen to fifteen (14-15) semester hours of work consisting of the following courses.

Chem	610	Inorganic Chemistry (Core Course)	3 s.h.
Chem	620	Analytical Chemistry (Core Course)	3 s.h.
Chem	630	Organic Chemistry (Core Course)	3 s.h.
Chem	640	Physical Chemistry (Core Course)	3 s.h.

One additional course designated by 600 Chemistry numbers selected from one of the four core areas. 2-3 s.h.

(2) Electives—five to six (5-6) semester hours.

The electives may be selected from the areas of Chemistry, Physics, Biology, and Mathematics by the student with the advice and approval of his adviser.

Chem. 500, Special Studies, (1-6 s.h./sem.) can provide a maximum of two (2) semester hours toward the thirty (30) semester hours necessary for the degree. This course can not be used as a substitute for Grad. 550.

*For those students emphasizing Biochemistry the Core Curriculum is modified to stress Biochemistry and Biology. Specific details can be obtained from the Chairman of the Chemistry Department.

Research and Thesis Requirements—ten (10) semester hours required.

(1) Grad 550 Research and Thesis	1-8 s.h./sem.
The research work must lead to an acceptable thesis, approved by the student's adviser and supervisory committee, and defended in a final oral examination.	
(2) Seminar—two (2) semester hours required	
Chem 600 Seminar	1 s.h./sem.

Course Descriptions

Chem 500 Special Studies

1-6 s.h./sem.

The course to be arranged with the instructor, is to provide the student with the opportunity for an intensive survey of the literature in a particular area as well as individual instruction on recent advances in chemical instrumentation, methods of research, and specialized subject areas.

Chem 505 Chemical Systems

2 s.h.

This course is designed to combine imaginative ideas and a great many chemical facts into an intelligible whole. Known as the Chemical Bond Approach (CBA), the course will be taught toward an understanding of the chemical content and laboratory techniques necessary to comprehend Chemical Systems.

Chem 506 Chemistry, An Experimental Science

2 s.h.

The course will place heavy stress on the experimental approach to the study of chemistry. The course, being completely laboratory oriented, will utilize the activities of science such as observation, search for regularities, creation and testing of models. This procedure will enable the student to understand atomic theory, mole concept, nature of chemical reactions, and chemical periodicity.

Chem 533 Chemical Literature

2 s.h.

The purpose of this course is to give the graduate student an opportunity to become more familiar with chemistry literature and to develop skill in the use of the literature. Periodicals, encyclopedias, handbooks, abstracting journals and other books dealing with the various divisions of chemistry will be studied. Students are required to conduct a literature search on a selected topic. Lecture—2 hours.

Chem 576 Radiochemistry

2 s.h.

Basic aspects of nuclear structure, the phenomena of radioactive isotopes and the chemical effects of such isotopes will be studied. Concurrent laboratory work utilizing instruments for detection and measurement of radioactive nuclides used in chemical experimentation will be done. Lecture—laboratory—3 hours.

Chem 600 Seminar

1 s.h.

A study of modern chemical research and research techniques. Scientific communication, including the role of the science library in research will be stressed. Students are required to take two semesters of this course. Lecture—1 hour.

Chem 602 Chemistry in Manufacturing Processes

3 s.h.

A course dealing with the applications of chemistry to manufacturing processes. Lecture and field trips. Lecture—3 hours.

Grad 550 Research and Thesis

1-8 s.h./sem.

Laboratory and literature work on the student's thesis problem done under the direction of a faculty member. This course should be started as soon as is practical.

Sci 572 Experimental Techniques in Chemistry and Physics 2 s.h.

Emphasis will be placed on scholarly experience in experimentation, observation, and application of scientific concepts. Classroom and lecture demonstrations will be prepared, presented, and evaluated by students and instructor. Special attention will be given to the development of new ideas and new ways of presenting scientific principles. Prerequisites: Chemistry I, II, Physics I, II. (Bordas)

INORGANIC**Chem 610 Inorganic Chemistry (core course) 3 s.h.**

A lecture course designed to acquaint the student with theoretical inorganic chemistry and, in particular, structure, periodicity, coordination chemistry, bonding and the chemistry of non-aqueous solvents. Lecture—3 hours.

Chem 611 Coordination Chemistry 3 s.h.

This course will deal descriptively and theoretically with the chemistry of transition metals, their compounds and complex ions. Lecture—3 hours.

Chem 612 Rare Earth Chemistry 2 s.h.

A course designed to deal with the theoretical and descriptive chemistry of the Lanthanum and Actinium series of elements. Lecture—2 hours.

Chem 613 Chemistry of the Representative Elements 2 s.h.

Essentially a descriptive course of the periodic group A elements and their compounds. Lecture—2 hours.

Chem 614 Inorganic Preparations 3 s.h.

The course deals with the preparation of inorganic compounds, expressing different techniques of synthesis. This course is designed for those students who have chosen to do inorganic research but have never had a preps. course. One lecture per week and six hours of lab.

ANALYTICAL**Chem 522 Advanced Instrumental Methods of Analysis 2 s.h.**

A survey of modern instrumental analysis including electrical methods, Spectrophotometric methods, x-ray methods, gas chromatography, and others as time permits. (Open to M.S. candidates by permission only).

Chem 620 Analytical Chemistry (core course) 3 s.h.

Theoretical principles of Analytical Chemistry. Lecture—3 hours.

Chem 621 Electroanalytical Chemistry 3 s.h.

Theoretical and practical considerations of Polarography, Potentiometric, amperometric, coulometric, and conductometric methods of chemical analysis. Lecture—2 hours. One 4-hour lab. per week.

Chem 622 Spectrochemical Methods of Analysis 3 s.h.

Application of the emission and absorption of light in the ultraviolet, visible and infrared regions to problems involving inorganic and organic molecular structure, analysis, equilibrium and reaction rates. Lecture—2 hours. One 4-hour laboratory per week.

Chem 623 Physical and Chemical Methods of Separation 3 s.h.

The application of chromatographic methods to the quantitative separation and analysis of chemical systems. Topics will include gas, column, paper, and ion exchange chromatographic methods and other

methods of separation as time permits. Lecture—2 hours. One 4-hour laboratory per week.

ORGANIC

Chem 630 Organic Chemistry (core course)

3 s.h.

The study of organic chemistry through a consideration of the mechanisms of organic reactions. The reasons why and how organic reactions occur will be discussed. Lecture—3 hours.

Chem 631 Polymer Chemistry

3 s.h.

A study of the chemistry of macromolecules, both natural polymers and synthetic polymers, including mechanisms of polymerization. Lecture—3 hours.

Chem 632 Stereochemistry

3 s.h.

The effect of spatial arrangement of atoms on the chemical and physical properties of molecules will be studied. Lecture—3 hours.

Chem 633 Heterocyclic Chemistry

3 s.h.

The chemistry of those cyclic compounds containing a ring atom other than carbon will be considered from the standpoint of both chemical and physical properties.

Chem 634 Synthetic Organic Chemistry

2 s.h.

This course is designed to bring to the student the newer and important preparative methods in organic chemistry at both the theoretical and practical level. Lecture—1 hour; lab. 4 hours.

PHYSICAL CHEMISTRY

Chem 640 Physical Chemistry (core course)

3 s.h.

The course provides a basic introduction to topics covered in advanced graduate courses. Lecture—3 hours.

Chem 641 Statistical Thermodynamics

3 s.h.

The application of statistical mechanics to chemical systems. Lecture—3 hours.

Chem 642 Chemical Kinetics

3 s.h.

The course provides an introduction to empirical, chemical, and theoretical kinetics. Lecture—3 hours.

Chem 643 Quantum Chemistry

3 s.h.

An introduction to quantum theory and its application to atomic and molecular structure, and spectroscopy. Lecture—3 hours.

Chem 644 Chemistry of Solids

3 s.h.

A laboratory course which applies chemical principles and utilizes modern instrumentation to investigate the properties of solids. (Lecture and lab.)

BIOCHEMISTRY

Chem 546-547 Biochemistry I and II

2 s.h./sem.

Courses covering and emphasizing the most recent developments in the areas of biochemistry such as amino acids, carbohydrates, lipids, nucleic acids, proteins, enzymes, metabolism and metabolic control. Lecture—2 hrs.

Chem 651 Biochemistry Topics

3 s.h.

A discussion of the important areas of biochemistry such as carbohydrates, lipids, amino acids, proteins, nucleic acids, kinetics, and metabolism. Lecture—3 hours.

Chem 652 Enzymes

3 s.h.

A study of enzymes to include isolation, kinetics, classification, specificity, mechanisms, cofactors, structure and formation. Lecture—3 hours.

COUNSELOR EDUCATION

George L. Spinelli, Chairman

William J. Leventry
Everett J. Pesci
Robert H. Saylor

Edward D. Shaffer
Jane B. Washburn
James C. Wilson

Students seeking preparation in counselor education may qualify for enrollment in one of two degree programs and in one of three certification programs.

Degree Programs

Degree programs include the Master of Education degree program designed for students seeking preparation and certification as elementary or secondary school counselors and the Master of Arts in Counseling Services degree program designed for students seeking preparation leading to guidance-related employment in non-school settings. Selection of one degree program over the other is determined by individual qualifications of applicants as reflected in educational-vocational background and purposes to be served in present and future employment.

Students are not admitted to candidacy in a degree program until they have successfully completed six (6) credit hours of coursework in foundations courses and submitted scores from the Graduate Record Examination general test. In addition, students in the M.Ed. degree program must take the advanced GRE test (#34) in Education. To avoid unnecessary delay in completing programs, these examinations should be scheduled and cleared in conjunction with foundations courses.

Upon admission to the Graduate School each student is assigned a departmental adviser who assists with all program matters. Subsequently, no course schedule will be accepted without prior adviser approval. Permit to Register Forms may be obtained from the student's adviser or from the Department office. Minimum requirements for degree programs include thirty (30) credit hours of coursework and completion of a research project or thesis on a topic relevant to the program in which the student is enrolled.

School Counselor Certification Programs

To qualify for institutional endorsement for provisional certification as an elementary or secondary school counselor, the student must complete all prescribed coursework and related examination and research requirements of the Master's degree in Education as defined by the Graduate School and the Department.

Counselor education majors should have a good understanding of educational philosophy, objectives, and practices. They should also have an understanding of the basic principles of psychology, sociology and anthropology, and sufficient background in mathematics to comprehend the statistical materials and methods with which the counselor must be familiar. Prospective students should include introductory courses in these areas in their undergraduate preparation.

Supervisor of School Guidance Services Program

Enrollees must meet all requirements for admission to the Graduate School and hold at least provisional certification as an elementary or secondary school counselor, including the Master's degree in (Counselor) Education. Applicants must also have at least one year of full-time experience as a school counselor. Institutional and departmental endorsement for provisional certification as a Supervisor of School Guidance Services includes completion of all coursework as outlined below.

Bus	541	Principles of Management	2 s.h.
CnEd	542	School Services	2 s.h.
CnEd	543	Planning Principles	2 s.h.
CnEd	544	Organizing Principles	1 s.h.
CnEd	545	Human Relations and Communications	2 s.h.
CnEd	546	Encounter and Sensitivity Training in Counseling	2 s.h.
CnEd	550	Supervision of Guidance Workers	4 s.h.
CnEd	551	Evaluation of Guidance Services	1 s.h.
		Elective	2 s.h.

Curriculum in Counselor Education

Courses required for provisional certification as elementary or secondary school counselors, including the Master of Education degree, are marked with a single or double asterisk. Courses marked with a double asterisk are required in the Master of Arts in Counseling Services degree program. Selections from Area II are made with the assistance and approval of the student's adviser. Note particularly that counselor education courses numbered above 541 are designed for students enrolled in the Supervisor's program.

AREA I: Foundations

Ed	511	Historical Foundations of Education	
Ed	512	Philosophical Foundations of Education	
Ed	513	Social Foundations of Education Select one of the above	*2 s.h.
Grad	516	Statistical Methods I	**2 s.h.
Grad	517	Statistical Methods II	2 s.h.
CnEd	531	Philosophy and Principles of Guidance	**2 s.h.

AREA II: Interdisciplinary Studies

Six (6) semester hours are required from this area. Selection will be based upon student needs and adviser approval.

El	531	Curriculum Problems in Elementary Education	2 s.h.
El	550	The Community and the Elementary School	2 s.h.
El	551	Recent Innovations in Elementary Education	2 s.h.
El	533	Reading Disabilities of Elementary School Children	2 s.h.
EdPsy	502	Advanced Educational Psychology	2 s.h.
EdPsy	572	Advanced Psychology of Childhood Education	2 s.h.
EdPsy	573	Advanced Psychology of Adolescent Education	2 s.h.
EdPsy	576	Advanced Studies in Behavior Problems	2 s.h.
Psy	530	Psychology of Growth and Development	2 s.h.
Psy	540	Advanced Mental Hygiene	2 s.h.
Psy	533	Psychology of Personality	2 s.h.
Psy	536	Psychology of Learning	2 s.h.
Psy	531	Psychology of the Exceptional Child	2 s.h.
Anth	591	Studies in Anthropology	2 s.h.
Anth	591	Comparative Cultures	2 s.h.
Econ	501	Foundations of Modern Economics	2 s.h.
Soc	562	Deviant Behavior	2 s.h.
Soc	563	Intergroup Relations	2 s.h.
SS	561	Social Policy Studies	2 s.h.

AREA III: Professional Studies

CnEd	533	Evaluative Methods in Guidance I	**2 s.h.
CnEd	534	Evaluative Methods in Guidance II	**2 s.h.
CnEd	535	Study of the Individual (Case Studies)	*2 s.h.

CnEd 536	The Information Service in Guidance	*2 s.h.
CnEd 537	Interview and Consultative Techniques	*2 s.h.
CnEd 538	Management of the Guidance Services	*2 s.h.
CnEd 539	Group Procedures in Guidance	*2 s.h.
CnEd 541	Supervised Experience in Counseling	**4 s.h.
Grad 515	Elements of Research	*2 s.h.
Grad 550	Thesis	2-4 s.h.

Course Descriptions

CnEd 531 Philosophy and Principles of Guidance 2 s.h.

This course is designed to give an overview of the genesis and development of guidance in American education. Philosophical concepts, psychological theories, cultural and social influences, and current practices are explored in the guidance context. Evolved principles and their relationship to the functions and implementations of guidance services are studied. It emphasizes the inter-relationships of philosophies and deals with the current issues in the guidance movement. The course presents a framework for additional preparation in counseling and some guidance principles and concepts useable by all who teach or counsel.

CnEd 533 Evaluative Methods in Guidance I 2 s.h.

This course is designed to present the basic concepts utilized in testing. Data concerning the purposes and types of tests, test administration, test scoring, test validity, and test selection will be carefully developed. Tests and testing will be considered as techniques for facilitating student development. The counselor will learn to use the tests to formulate hypotheses about student behavior and to provide the pupil with more adequate descriptive, genetic, and predictive information about himself and his possibilities. Prerequisite CnEd 531, Grad 516.

CnEd 534 Evaluative Methods in Guidance II 2 s.h.

In this course the student will make an intensive study of selected representative tests and instruments in areas of aptitude, achievement, interest, and personality. Extensive laboratory work will be required. The student will have an opportunity to apply the basic concepts learned about tests and testing in Evaluative Methods in Guidance I. Elementary and secondary counseling majors will deal with those tests most significant to their areas of interest and need. Prerequisite CnEd 533.

CnEd 535 Case Study Techniques 2 s.h.

This course is designed to permit the student to study the principles, problems, methods, and content involved in understanding the individual student. This course draws together from all possible sources the kind of information the counselor will need to understand the individual pupil and his developing self-concept. The case study approach will be used to show a longitudinal pattern of personality dynamics. The student's knowledge of self and his interaction with the environment will be studied to show patterns and trends in the evolving development of the individual. Students will have ample opportunity to read and listen to tapes of completed case studies and to develop their own cases. Prerequisite CnEd 531, 533.

CnEd 536 The Information Service in Guidance 2 s.h.

The course is designed to present the information service as a distinct and vital part of the total guidance service. Emphasis is placed upon the relationship between the information service and other guidance services; the theories related to decision making; the use of information in the process of educational, social, and vocational development; the collection, evaluation, filing, and uses of information; and the programming of information activities. Prerequisite CnEd 531.

CnEd 537 Counseling and Consultative Techniques 2 s.h.

The primary purpose of this course is to help the student acquire the requisite theoretical and perceptual background for the counseling and consultative functions of guidance. Theories, objectives, principles, and practices of counseling and consulting with individuals are covered. Interview techniques are presented for maximum development in the subsequent practicum experience. Considerable attention is given to interview report writing and the utilization of objective data in diagnosis and prognosis. Prerequisite CnEd 533, 535.

CnEd 538 Management of the Guidance Services 2 s.h.

It is the primary purpose of this course to help the guidance counselor acquire the necessary competencies to manage the guidance services. Emphasis is placed upon the planning, organizing, coordinating, directing, and controlling functions of management as applied to guidance services within the framework of the school's philosophy and statement of objectives. Prerequisite CnEd 531, 533, 534, 536, 537.

CnEd 539 Group Procedures in Guidance 2 s.h.

This course is designed primarily to consider group procedures in guidance and give the counselor a matrix for the successful use of the various techniques used in the group approach. Considerable emphasis will be placed upon the nature of groups, the techniques involved in the development of the dynamics of group behavior, the formation and operation of groups, the organization and structure of groups, and the influence of the group upon the individual as they relate to common problems. Throughout the course the student will acquire those understandings and abilities that will enable him to evaluate the outcomes of group procedures in order to do a more effective job in the area of guidance. Prerequisite CnEd 531.

CnEd 541 Supervised Experience in Counseling 4 s.h.

This course provides a practicum experience in counseling and consulting techniques to include the interview, observations, written reports, and group interaction. Students work with pupils, teachers, parents and others in school settings, and, consistent with the view that guidance services extend to all pupils, emphasis is on the developmental approach rather than problem-centered. Since aspects of all component guidance services are included, this course is scheduled as a terminal course in the program.

CnEd 542 School Services 2 s.h.

This course is designed to analyze critically the written statements of educational philosophies and objectives of selected elementary and secondary schools. The student will prepare a written statement of educational philosophy and objectives for a school in which he is or has been employed. This statement will serve as a guide for the critical examination of philosophies and objectives for the school services—instructional, administration and supervisory, and pupil personnel. The philosophies, objectives, and functions of the school services will be examined to permit the director of guidance services to understand the relationship of the guidance services to the school services in order to function meaningfully with the personnel of the school services.

CnEd 543 Planning Principles 2 s.h.

The student will develop written statements of guidance services philosophy and objectives. Program elements for each of the guidance services will be established from the objectives. These elements will be critically analyzed to determine personnel needs, facilities, and materials necessary, in-service program requirements, and budgetary demands. Prerequisite Bus 541, CnEd 542.

CnEd 544 Organizing Principles

1 s.h.

The student will identify tasks necessary to the program fulfillment of guidance services objectives. Personnel qualified to perform tasks will be identified. Techniques to relate tasks to personnel will be examined to develop structural patterns necessary to initiate guidance services programs in districts of various sizes and compositions. Prerequisite CnEd 543.

CnEd 545 Human Relations and Communications

2 s.h.

The student will develop skill in programming the various guidance services for the school year throughout the district. Human relations principles and techniques to elicit cooperation from personnel involved in the program of guidance services will be examined. Skills in communicating with personnel participating in the program of guidance services and with the public will be developed.

CnEd 546 Encounter and Sensitivity Training in Counseling 2 s.h.

This seminar is a special extension of the counselor's practicum in counseling. It is designed to help directors of guidance services to see themselves and gain sensitivity to others and to assist counselors and other school personnel in seeing themselves and gaining sensitivity as a prerequisite to effective work with pupils with socioeconomic class, ethnic, racial, age, and sex group differences.

CnEd 550 Supervision of Guidance Workers

4 s.h.

This course is a practicum designed to provide allied experience in the supervision of school counselors, elementary and secondary, in the preparation program for directors of guidance services. Primary focus is on the supervision of counseling service content and process, but components of all guidance services are included. (Enrollment by permission).

CnEd 551 Evaluation of Guidance Services

1 s.h.

The student will acquire the skill to evaluate the program of guidance services as it is related to the educational objectives and the guidance services objectives of the school. This will include the initiation of appropriate research and the preparation and reporting of recommendations based upon the findings. Prerequisite CnEd 544.

EDUCATIONAL PSYCHOLOGY

Anthony A. Angeloni, Chairman

William M. Bahn
William E. Cutler
Leonard B. DeFabio
John J. Hays
Isabel T. Helmrich

Oliver W. Helmrich
William J. Leventry
Bruce A. Meadowcroft
Mildred N. Shank

SCHOOL PSYCHOLOGY PROGRAM

I. SCHOOL PSYCHOLOGIST CERTIFICATION PROGRAM

The School Psychology program is designed for those students who are seeking Certification as Public School Psychologists in the Commonwealth of Pennsylvania. Candidates for admission to the Certification Program must have a Master's degree and an Instructional or Specialist certificate from an accredited institution. Students who have a Master's degree in Counseling, Special Education, Psychology, or related fields will have completed some requisite courses for the program. The program is inter-disciplinary in nature and requires specific courses in the Departments of Educational Psychology, Psychology, Special Education, Counselor Education, and General Service courses.

The curriculum is tailored to meet individual needs in terms of the background and attained skills of each candidate. There is no single approved or preferred route of entry into school psychology. The certification program will, therefore, adapt differently to the education major with several years of teaching experience but a minimal psychological background, and to the individual with experiences and graduate work in related, but not directly applicable, fields. Courses marked with an asterisk must be scheduled by all candidates to the program unless previously completed at graduate level. The Graduate Record Examination, including Psychology, must be taken by all candidates prior to final approval by the Advisory Committee. Tentative approval is given at initial entry and final approval after taking four approved semester hours.

II. SPECIFIC REQUIREMENTS

A minimum of 24 semester hours of credit must be earned while the student is enrolled at Indiana University of Pennsylvania in the School Psychology Certification Program. The twenty-four hours include a clinical internship of twelve (12) semester hours. Forty-five (45) clock hours are considered equivalent to one semester hour of clinical practicum.

Upon admission to the Graduate School, students will be assigned an advisor from the School Psychology Staff who will assist with all matters related to the individual's program. Students will have their credits evaluated by the Advisory Committee for the purpose of determining specific program requirements. The students will be notified of the results of this evaluation prior to taking any course work. No course work may be scheduled without the advisor's approval.

Students who enter the Certification Program in School Psychology will be certificated by Indiana University of Pennsylvania as a school psychologist when they have demonstrated thorough competencies in the evaluation of human characteristics, methods of recording evaluative information, group and individual clinical techniques, and related educational practices; and completed a minimum of 24 semester hours of graduate work beyond the Master's degree as approved by the Advisory Committee.

III. CERTIFICATE OF ADVANCED STUDY IN SCHOOL PSYCHOLOGY

Advanced study courses will be open to certificated School Psychologists who have experience with school-age children beyond the internship. Indiana University of Pennsylvania will issue a Certificate of Advanced Study in School Psychology to those students who have completed a minimum of twenty-four hours in the certification program and six hours in the advanced study program.

IV. ADMISSION REQUIREMENTS

Application for admission to the program is made to the Graduate Office. Specific procedures for admission to candidacy for the School Psychology Program are included in the application packet. In addition to completed application forms, official transcripts of all completed college level study are required with a satisfactory grade point average. Additional letters of recommendation, transcripts, and questionnaires about the applicant are also required for the School Psychology Program student's file prior to the interview by members of the School Psychology Staff.

Candidates will be selected on the basis of background and experience record, letters of recommendation, personal interview, and revealed potential as a School Psychologist and professional in education.

PROCEDURES FOR ADMISSION TO CANDIDACY FOR THE SCHOOL PSYCHOLOGY PROGRAM

1. Candidate must be admitted to the Graduate School as a qualified student.
2. Candidate must secure the School Psychology application packet from the Director, School Psychology Program, Educational Services Center, Indiana University of Pennsylvania, Indiana, Pa., 15701. Questions concerning the program should be addressed to the Director. Candidate must complete questionnaire and arrange for the forwarding of references and transcripts to the Director for review. An adviser will be assigned to answer individual questions of the candidate. The applicant's adviser may be contacted, at any time, concerning the progress of the application or if the applicant has further questions.

The Graduate Record Examination, including Psychology, must be taken by all candidates prior to final approval by the Advisory Committee. Tentative approval is given at initial entry and final approval after taking four approved semester hours.

3. After Steps 1 and 2 are completed, the application will be reviewed by the Advisory Committee and interviews will be arranged with qualified candidates. Those not qualified will be advised at this time.
4. After the interviews, qualified candidates will be notified of their admission to candidacy or that they have not been admitted to candidacy.
5. Candidates admitted to the program will meet with the Advisory Committee and arrange for an approved program of courses. No courses will be accepted unless they are on this approved program. Arrangements are to be made through the adviser. Successful completion of an approved program will result in certification as a school psychologist.
6. Candidates taking advanced study courses must work through their advisers with the Advisory Committee for an approved program of courses. No courses will be accepted unless they are on this approved program.

COURSE SELECTIONS

- * Courses marked with an asterisk are required, unless waived by the Advisory Committee, and are representative of a minimal program designed to develop competencies of a Public School Psychologist.
- (†) Items marked with a (†) are restricted and available only to approved candidates in the School Psychology Program.

AREA I FOUNDATIONS

(Minimum—6 s.h.)

Required:

*Foundations (one course)	2 s.h.
FnEd 511 Historical Foundations of Education (2 s.h.)	
FnEd 512 Philosophical Foundations of Education (2 s.h.)	
FnEd 513 Social Foundations of Education (2 s.h.)	
*Grad 515 Elements of Research	2 s.h.
*Grad 516 Statistical Methods I	2 s.h.

Electives:

Grad 517 Statistical Methods II	2 s.h.
Grad 550 Thesis	2-4 s.h.

AREA II PROFESSIONAL SPECIALIZATION (Minimum—24 s.h.)

Required: (Minimum—18 s.h.)

*EdPsy 506 Advanced Educational Tests and Measurements	2 s.h.
*EdPsy 521 Diagnosis and Remediation of Learning Disabilities for Educational Specialists	2 s.h.
*EdPsy 532 Studies in Pupil Adjustment (or)	2 s.h.
Psy 540 Advanced Mental Hygiene (2 s.h.)	
*Approved Developmental Psychology Elective	2 s.h.
EdPsy 572 Advanced Psychology of Childhood Education (2 s.h.)	
EdPsy 573 Advanced Psychology of Adolescent Education (2 s.h.)	
*EdPsy 576 Advanced Studies in Behavior and Learning Problems	2 s.h.

*Psy 531 Psychology of the Exceptional Child	2 s.h.
*Psy 533 Psychology of Personality	2 s.h.
*Psy 534 Abnormal Psychology	2 s.h.

*Approved Guidance Elective	2 s.h.
CnEd 531 Philosophy and Principles of Guidance (2 s.h.)	
CnEd 535 Study of Individual—Case Studies (2 s.h.)	
CnEd 537 Interviewing Techniques (2 s.h.)	

Approved Electives: (Minimum—6 s.h.)

(Other Electives may be approved by the Advisory Committee)

EdPsy 501 Seminar in Special Topics in Educational Psychology	2 s.h.
EdPsy 502 Advanced Educational Psychology	2 s.h.
EdPsy 518 Interpretation of Psychological Tests for Reading Specialists	2 s.h.
Psy 538 Psychology of the Gifted Child	2 s.h.
Psy 539 Psychology of the Mentally Retarded Child	2 s.h.
El 531 Curriculum Problems in Elementary Education	2 s.h.
Ed 522 Principles and Practice in Speech Improvement	2 s.h.
El 511 The Teaching of Reading in the Secondary School	2 s.h.
Spe 520 Curriculum and Methods (Elementary)	2 s.h.
Spe 521 Curriculum and Occupational Education (Secondary)	2 s.h.
Spe 522 Orientation to Rehabilitation	2 s.h.
Spe 530 Organization and Administration of Programs for Exceptional Children	2 s.h.
Spe 535 Guidance and Adjustment	2 s.h.
Spe 565 Education of Children with Social and Emotional Maladjustments	2 s.h.
Soc 562 Deviant Behavior	2 s.h.
Soc 563 Intergroup Relations	2 s.h.

AREA III	PSYCHOMETRICS AND PRACTICUM (Min.—24 s.h.)
Required:	
(†)*EdPsy 511	Introduction to Educational Specialists 2 s.h.
(†)*EdPsy 560	Human Relations and Communications in Education 2 s.h.
(†)*EdPsy 512	Individual Psychometrics and Clinical Evaluation I—Binet Scale 2 s.h.
(†)*EdPsy 513	Individual Psychometrics and Clinical Evaluation II—Wechsler Scales 2 s.h.
(†)*EdPsy 514	Individual Psychometrics and Clinical Evaluation III—Special Clinical Tests 2 s.h.
(†)*EdPsy 565	Seminar in Problems of School Psychologists 2 s.h.
(†)*EdPsy 550	Clinical Practicum 12 s.h.
AREA IV	ADVANCED STUDY PROGRAM (Minimum—6 s.h.)
(Courses are open to certificated School Psychologists who have experience with school-age children beyond the in- ternship. Other electives may be approved by the Ad- visory Committee.)	
(†)*EdPsy 551	Advanced Clinical Practicum 2 s.h.
(†)*EdPsy 561	Seminar in Inter-Disciplinary Coordination and Communication 2 s.h.
(†)*EdPsy 562	Counseling and Psychotherapy 2 s.h.
(†)*EdPsy 563	Introduction to Projective Techniques for School-Age Children 2 s.h.
(†)*EdPsy 564	Seminar in Advanced Projective Techniques for School-Age Children 2 s.h.

COURSE DESCRIPTIONS

EdPsy 501 Seminar in Special Topics in Educational Psychology 2 s.h.

This course is designed for those students who wish to do independent research in special areas.

EdPsy 502 Advanced Educational Psychology 2 s.h.

An upward extension of Educational Psychology with a systematic review of current research. An expanded review of learning theory with emphasis on classroom application and remediation.

EdPsy 506 Advanced Educational Tests and Measurements 2 s.h.

A course which emphasizes an understanding of the various evaluation instruments with attention being focused on standardized tests. The use and interpretation of information and test results are studied in relation to educational problems which occur in the classroom.

EdPsy 511 Introduction to Educational Specialists 2 s.h.

A survey course recommended for educators interested in exploring the duties and responsibilities of the various professional positions in the schools other than classroom teaching.

EdPsy 512 Individual Psychometrics and Clinical Evaluation I: Binet and Cattell Scales 2 s.h.

Theoretical concepts of individual psychometric testing and professional competency in administration, scoring, and basic interpretations of Stanford Binet and related scales of intelligence. Practical experiences in administration and interpretation will be particularly related to the school-age child. The significance of written and oral communication function within public school programs and ethical responsibilities will be stressed. Prerequisite: EdPsy 511. For approved School Psychologist candidates.

EdPsy 513 Individual Psychometrics and Clinical Evaluation II:**Wechsler Scales****2 s.h.**

Theoretical concepts of individual psychometric testing and professional competency in administration, scoring, and basic interpretation of the Wechsler Scales: W.P.S.S.I., W.I.S.C., W.A.I.S. and awareness of their predecessors. Practical experiences in administration and interpretation will be particularly related to the school-age child. The significance of written and oral communication function within public school programs and ethical responsibilities will be stressed. Prerequisite: EdPsy 511 and 512, For approved School Psychologist candidates.

EdPsy 514 Individual Psychometrics and Clinical Evaluation III:**Special Clinical Tests****2 s.h.**

Skill is developed with Merrill-Palmer, Bender Gestalt, Vineland Social Maturity, Peabody Picture, Vocabulary, Van Alstyne, Good-enough Draw-A-Man, Wide Range Achievement, individual reading surveys, individual tests of skill and aptitude (other than intelligence), and other pertinent tests. Activities described in Individual Psychometrics I and II as required, apply to this course. Prerequisite: EdPsy 511, 512, 513, For approved School Psychologist candidates.

EdPsy 518 Interpretation of Psychological Tests for the Reading Specialists**2 s.h.**

This course is designed for the graduate student enrolled in the program for preparation as a Reading Specialist in the public schools in order to understand, evaluate, and interpret the results of psychological tests accurately and meaningfully. This objective would be achieved by the use of the following approaches: (1) through an understanding of the principles of test construction, (2) through psychological knowledge of the behavior being measured, (3) through familiarity with the field of available testing instruments. Prerequisite: For approved Reading Specialist candidates.

EdPsy 521 Diagnosis and Remediation of Learning Disabilities for Educational Specialists**2 s.h.**

A course designed to help Educational Specialists recognize and diagnose a child's learning abilities and specific disabilities; understand the remediation process; and be able to make meaningful judgements.

EdPsy 532 Studies in Pupil Adjustment**2 s.h.**

This course considers the problems of human adjustment in relation to causative factors. (Pre-school through adolescent and youth). It stresses the dynamics of personal and interpersonal relationships and explores the role and function of the parent, the teacher and available specialists in remedial treatment. Case material will be used with direct application to specific problems.

EdPsy 550 Clinical Practicum**2-6 s.h.**

Extensive supervised clinical and field experiences in psychometric, diagnostic, therapeutic and remediation techniques and processes. Forty-five clock hours shall be equivalent to one semester hour of clinical credit. Prerequisite: EdPsy 511, 512, 513, For approved School Psychologist candidates.

EdPsy 551 Advanced Clinical Practicum**2-6 s.h.**

Clinical and Field Experience, with difficult cases. Diagnosis and remediation with Severely Mentally and Physically Handicapped and Emotionally Disturbed children will be stressed. Forty-five clock hours shall be equivalent to one semester hour of clinical credit. Prerequisite: EdPsy 550, For approved School Psychologist candidates.

**EdPsy 560 Human Relations and Communications
in Education**

2 s.h.

Development of competencies in the area of communication with pupils, teachers, administrators and supervisors, parents, agencies and other disciplines. Prerequisite: EdPsy 511, For approved School Psychologist candidates.

**EdPsy 561 Seminar in Interdisciplinary
Coordination and Communication**

2 s.h.

Functions, duties and services provided by the many different agencies of the community with whom Educational Specialists have come in contact. Extensive visitation and conferences will be required. Prerequisite: For Educational Specialists, Administrators and Supervisors.

EdPsy 562 Counseling and Psychotherapy

2 s.h.

A systematic study of the major techniques of psychotherapy. Special emphasis will be given to adaptations to children, also the ethics and limitations are thoroughly discussed. Prerequisite: EdPsy 550, For approved School Psychologist candidates.

**EdPsy 563 Introduction to Projective Techniques for
School-age Children**

2 s.h.

An introduction and exposure to various projective techniques. Training and supervised application of some techniques. Emphasis will be given to the Thematic Apperception Test (TAT) and the Children's Apperception Test (CAT). Prerequisite: EdPsy 550, For approved School Psychologist candidates.

**EdPsy 564 Seminar in Advanced Projective Techniques
for School-age Children**

2 s.h.

Continued application and skill development of techniques covered in EdPsy 563, Introduction to Rorschach and Holtzman techniques with supervised practicum. Prerequisite: EdPsy 563, For approved School Psychologist candidates.

EdPsy 565 Seminar in Problems of School Psychologists

2 s.h.

Discussion and direct attack on current problems confronting school psychologists. Students will be required to research individual problems and present effective solutions and/or alternatives. Prerequisite: EdPsy 550, For approved School Psychologist candidates.

EdPsy 572 Advanced Psychology of Childhood Education

2 s.h.

This course is designed to emphasize the relationship which physical, social, emotional and intellectual development have on the theory and practice of childhood and pre-adolescent education.

EdPsy 573 Advanced Psychology of Adolescent Education

2 s.h.

This course is concerned with the study of the significant characteristics and behavior of adolescents with emphasis on developing an understanding of the relationship these factors have for educational and social problems which occur during this period of development.

**EdPsy 576 Advanced Studies in Behavior and
Learning Problems**

2 s.h.

This course explores the emotional and social aspects of behavior problems encountered in classroom situations. The assumption that behavior is learned and purposeful forms a basis for study in the course. This course is also intended to help teachers who deal with learning problems in the several basic skill and subject areas in the typical school setting.

ELEMENTARY EDUCATION

Ralph M. Glott, Chairman
Edward R. Mott, Director of Graduate Studies

Ronald L. Baker
Alberta R. Dorsey
Joseph A. Kazamek
Robert L. King

Jack Kuhns
P. David Lott
Donald C. McFeely
James B. Reilly

George D. Zepp

The Elementary Education curriculum is designed to permit the student to strengthen his background in academic areas as well as professional education. If courses are carefully selected, some specialization is possible in fields such as language arts and social studies. The course titles and descriptions are self-explanatory, and the student may use much freedom to build his own program.

At the Master of Education level an adviser is usually not selected until the student begins his research project. For his first few courses a student would probably wish to include a foundations course and one each from general and professional studies. Grad 515, Elements of Research, should be taken by the time twelve credits have been earned. In order to avoid scheduling problems each student should outline his complete 30-credit curriculum early in his program and have it reviewed by a staff member. Programs in reading follow in a later section.

Advanced graduate students please refer to the section on the Doctor of Education degree.

MASTER OF EDUCATION DEGREE IN ELEMENTARY EDUCATION

Students working for the degree in Elementary Education will complete thirty hours of work in accordance with the following divisions:

I. General Studies—select a minimum of twelve (12) semester hours. Many other courses may be selected in this area. Those with a prefix of El., Ed., Psy., or CnEd will not be accepted.			
Art	521	Contemporary Movements in Art	2 s.h.
Bus	570	Economic Backgrounds of Business	2 s.h.
Ed	522	Principles and Practices in Speech Improvement	2 s.h.
Eng	521	Modern European Fiction	2 s.h.
Eng	523	The Development of Modern English	2 s.h.
Eng	525	The Early English Drama	2 s.h.
Eng	557	Modern American Poetry	2 s.h.
FL	521	Language and Society	2 s.h.
Geog	521	Advanced Human Geography	2 s.h.
HE	521	Problems in Family Living	2 s.h.
HPe	521	Advanced Seminar in Health and Safety	2 s.h.
HPe	530	Workshop in Community-School Health Education	2 s.h.
Math	521	Basic Concepts in Mathematics	2 s.h.
Mus	521	Music Literature and Materials	2 s.h.
Phil	580	Readings in Religious Thought	2 s.h.
Phil	581	Problems of Logic	2 s.h.
Phil	582	Problems of Ethics	2 s.h.
Phil	583	American Philosophic Thought	2 s.h.
SS	521	Contemporary American Issues	2 s.h.
SS	561	Social Policy Studies	2 s.h.

II.	Professional Studies—select a minimum of twelve (12) semester hours.	
LRes	500 Seminar in Learning Resources	2 s.h.
Grad	516 Statistical Methods I	2 s.h.
Grad	550 Thesis	2 s.h.
El	500 Basic Foundations of Reading Instruction	2 s.h.
El	501 Diagnosis and Remediation of Reading Disabilities	2 s.h.
El	531 Curriculum Problems in Elementary Education	2 s.h.
El	541 Special Problems in Elementary Social Studies	2 s.h.
El	542 Arithmetic in the Elementary School	2 s.h.
El	543 Resource Materials in Elementary Science	2 s.h.
El	544 Recent Trends in Elementary Language Arts	2 s.h.
El	545 Experimental Studies in Art Education	2 s.h.
El	546 Modern Procedures and Skills in Elementary Music	2 s.h.
El	547 Resource Materials in Children's Literature	2 s.h.
El	548 Creativity and the Elementary School Child	2 s.h.
El	549 Methods and Materials in Pre-School Education	2 s.h.
El	550 The Community and the Elementary School	2 s.h.
El	551 Recent Innovations in Elementary Education	2 s.h.
El	552 Evaluating the Elementary School	2 s.h.
El	553 Supervision and Improvement of Instruction in the Elementary School	2 s.h.
El	554 Administration of the Elementary School	2 s.h.
El	555 Advanced Human Development and Learning	2 s.h.
*El	577 Supervised Internship	2 s.h.
*El	578 Seminar in Elementary Education Internship	2 s.h.
*El	579 Independent Study in Elementary Education	2 s.h.
*El	580 Seminar in Advanced Research	2-4 s.h.
Psy	531 Psychology of the Exceptional Child	2 s.h.
Psy	532 Studies in Pupil Adjustment	2 s.h.
Psy	540 Advanced Mental Hygiene	2 s.h.

*to be scheduled by doctoral candidates only with permission.

III. Foundations of Education—two (2) semester hours of work to be selected from the following courses.

Ed	511 Historical Foundations of Education	2 s.h.
Ed	512 Philosophical Foundations of Education	2 s.h.
Ed	513 Social Foundations of Education	2 s.h.

IV. Research Techniques—the following course is required. It should be scheduled early in the student's program:

Grad	515 Elements of Research	2 s.h.
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PROGRAMS IN READING

The curricula in the programs in Reading are designed to provide educational experiences which meet the needs of persons seeking competencies and subsequent certification in Reading. The curricula are intended to provide opportunities for a comprehensive educational experience and to be sufficiently flexible to allow for specialization in a specific area or level of interest in a field within Reading.

The Indiana University of Pennsylvania offers a degree at the master's level in its program of Reading. In addition, the program's curricula are designed to permit students to fulfill the requirements for certification as: (1) Reading Specialists, (2) Reading Supervisors.

The programs in Reading provide a variety of opportunities for students to complete certification and degree requirements. Evening and summer courses are provided for those students who are employed full-time in the education professions.

Required courses for each certification program are listed below.

Reading Specialist

Students seeking a Master of Education Degree in Reading and who desire certification as a Reading Specialist are required to complete the requirements outlined below. A minimum of 30 semester hours is required for the degree and certification as a Reading Specialist. Some students may have to schedule additional semester hours to reach the required level of competency. All courses scheduled must have the written approval of his Reading adviser.

MASTER OF EDUCATION DEGREE IN READING

I. Reading and Related Subject Matter		Hours Required	12
*El	500	Basic Foundations of Reading Instruction	2 s.h.
*El	501	Diagnosis and Remediation of Reading Disabilities	2 s.h.
*El	502	Reading Practicum: Diagnostic Case Studies ...	2 s.h.
*El	503	Reading Practicum: Remedial Case Studies	2 s.h.
El	507	Instructional Materials in Reading for Children and Youth	2 s.h.
El	508	Reading in the Content Areas	2 s.h.
El	511	The Teaching of Reading in the Secondary School	2 s.h.
El	547	Resource Materials in Children's Literature	2 s.h.
II. Educational Psychology		Hours Required	4
*EdPsy	502	Advanced Educational Psychology	2 s.h.
*EdPsy	506	Advanced Educational Tests and Measurements	2 s.h.
*EdPsy	518	Interpretation of Psychological Tests for the Reading Specialist	2 s.h.
III. Psychology		Hours Required	6
*Psy	531	Psychology of the Exceptional Child	2 s.h.
Psy	534	Abnormal Psychology	2 s.h.
Psy	535	Differential Psychology	2 s.h.
Psy	540	Advanced Mental Hygiene	2 s.h.
Psy	539	Psychology of the Mentally Retarded	2 s.h.
Psy	538	Psychology of the Gifted Child	2 s.h.
IV. Educational Research		Hours Required	6
Grad	512	Thesis or Research Project	2 s.h.
Grad	515	Elements of Research	2 s.h.
Grad	516	Statistical Methods I	2 s.h.
V. Foundations of Education		Hours Required	2
Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.

*Required

Reading Supervisor

Students seeking certification as Reading Supervisors must not only complete the requirements for the Master of Education Degree in Reading, be eligible for a Level III certificate, but also earn 18 additional semester hours of course work selected from Reading Supervisor's Program of Studies below. A minimum of forty-eight (48) semester hours is required for certification as a Reading Supervisor. Some students may have to schedule additional semester hours to reach the required level of competency. All courses scheduled must have the written approval of his Reading adviser.

I. Reading and Related Subject Matter			Hours Required 8
*El	504	Remediation of Severe Reading Disability	2 s.h.
*El	505	Administration and Supervision of Reading Programs	2 s.h.
*El	506	Practicum in Advanced Diagnosis and Remediation of Severe Reading Disability Cases	2 s.h.
El	513	Modern Concepts in Developmental Reading	2 s.h.
El	544	Recent Trends in Elementary Language Arts	2 s.h.
II. Educational Research			Hours Required 2
Grad	517	Research and Literature in Reading	2 s.h.
III. Curriculum and Supervision			Hours Required 4
El	531	Curriculum Problems in Elementary Education	2 s.h.
*El	553	Supervision and Improvement of Instruction in the Elementary School	2 s.h.
El	554	Administration of the Elementary School	2 s.h.
Ed	515	Theoretical Bases for Decision-making in Curriculum Development	2 s.h.
IV. Other Areas			Hours Required 4
Eng	512	American English Grammar	2 s.h.
Eng	544	Seminar in the Psychology of Language	2 s.h.
CnEd	531	Philosophy and Principles of Guidance	2 s.h.
Ed	522	Principles and Practice in Speech Improvement	2 s.h.
Ed	555	Advanced Human Development and Learning	2 s.h.
SpEd	565	Education of Children with Social and Emotional Maladjustments	2 s.h.

*Required

Course Descriptions

El 500 Basic Foundation of Reading Instruction 2 s.h.
 This course involves a study of factors governing the reading act of the pupil in reference to the psychology and physiology of reading as they are related to the sociological and historical backgrounds of man. Interrelationships of reading and child development, the reading process and its implications for reading instruction are shown by means of presenting the various methods and skills, the altered alphabetic systems, the linguistic approaches and the materials of instruction. Informal reading inventories and group and individual reading test are given their share of attention. (Replaces El 533)

El 501 Diagnosis and Remediation of Reading Disabilities 2 s.h.

This course is limited to a study of diagnostic procedures and remediation techniques which will help children with mild reading disabilities. It is designed for the classroom teacher who does not have the time to make more detailed diagnosis by means of tests and/or other sophisticated devices nor to provide the detailed remediation that is often necessary. (Replaces Ed 534) Prerequisite: El 500.

El 502 Reading Practicum: Diagnostic Case Studies 2 s.h.

This laboratory will give the student the opportunity to put into practice the techniques of diagnosis he has learned in the preceding course titled **Diagnosis and Remediation of Reading Difficulties**. By preparing a case study on a pupil who has been referred to the clinic as having a reading disability, the student will have the advantage of administering and interpreting a battery of tests, formal and informal, that will hopefully lead to specific recommendations for remediation.

EL 503 Reading Practicum: Remedial Case Studies 2 s.h.

In the laboratory the student will have the opportunity to design a remedial program for an individual pupil based on a study of the previously written case study. The student will design and implement the program, select the appropriate learning materials, administer further diagnostic tests to determine the improvement, if any, and make recommendations for further remediation.

EL 504 Remediation of Severe Reading Disability Cases 2 s.h.

This course considers the scope of extreme disability reading cases, analysis and treatment. It includes: (1) primary and secondary classifications of reading difficulties, (2) specific patterns of syndromes of severe reading disabilities together with diagnosis and prognosis of them, and (3) specific treatment advocated for these disabilities.

EL 505 Administration and Supervision of Reading Programs 2 s.h.

The role of the administrator and reading specialist in reading programs will be studied. Programs will be designed to achieve different purposes; supervision of classroom teaching, creation of new developmental programs, parental and public relations, reorganizing of current programs, and survey of needs for program planning.

EL 506 Practicum in Advanced Diagnosis and Remediation of Severe Reading Disability Cases 2 s.h.

This practicum is designed to provide an opportunity for each enrollee to work with students with severe reading disabilities under the supervision of especially trained university personnel. It is tailored to meet the individual needs of the enrollee. Activities will be planned to go into greater depth in diagnosis and/or remediation.

EL 507 Instructional Materials in Reading for Children and Youth 2 s.h.

This course is designed to familiarize the student not only with the materials for teaching reading including basal reading series comprehension development materials, word attack materials, audio-visual materials, and mechanical devices, but also the basic issues underlying the selection and use of reading instructional materials for atypical learners in basic reading instruction and the content areas in K-12.

EL 508 Reading in the Content Areas 2 s.h.

The emphasis of this course is on problems related to teaching students the reading and study skills specifically needed in each of the subject areas at the elementary and secondary school levels. Content teachers learn how to develop students' competence in these skills as part of their regular classroom instruction. Reading specialists study ways to help classroom teachers be more effective in this kind of instruction.

EL 509 Foundations of Reading Instruction: Primary 2 s.h.

This course is developed especially for the primary grade teacher. Major current innovations in methods and materials and innovations in testing at the beginning stages of reading in the primary grades will be examined in depth. The nature and sources of research evidence on primary reading instruction will be investigated and analyzed.

EL 510 Foundations of Reading Instruction: Intermediate 2 s.h.

Focuses on the innovations and changes in reading instruction that apply to grades four, five, and six. It is designed to provide teachers for guiding growth in the mechanics and refinement of reading skills needed by middle grade children. Attention is given to problems of primary reading as a preliminary to further understanding of the sophistication required of more mature pupils.

El 511 The Teaching of Reading in the Secondary School 2 s.h.

For secondary teachers. The developmental reading program in secondary schools; use of reading in various curriculum areas, appraisal of reading abilities, and techniques and materials for helping reluctant and retarded readers.

Grad 512 Thesis or Research Project in Reading 2 s.h.

Individual study. The thesis or research project may be an organized scientific contribution or a comprehensive analysis of theory and practice in a specific area.

El 513 Modern Concepts in Developmental Reading 2 s.h.

This course makes an intensive study of the up-to-date methods and materials required to teach developmental reading in the public schools. This course provides an understanding in depth of reading for prospective Reading Specialists.

El 514 Learning Theory Applied to Reading 2 s.h.

The purpose of this course is to provide prospective reading specialists with a comprehensive picture of modern learning theories as they apply to reading. The course will be constructed in such a way as to guide the student into critical evaluation and analysis of reading practices in relation to prevalent theories of learning. Students will be encouraged to use learning theories in formulating ways in which the theories would be translated in reading behavior and behavioral modification.

El 515 Interprofessional Seminar 2 s.h.

The Interprofessional Seminar is designed for graduate students to share in discussions relating to pupil personnel services appropriate for the schools. Primary focus is upon the interprofessional relationships of each service, emphasizing basic responsibilities with regard to unity of effort in providing those services necessary to accomplish effective and efficient support to the school pupil.

El 517 Research and Literature in Reading 2 s.h.

The course is designed to familiarize the student with the major research studies done in reading. Specifically, each student will study the following types of research in the field of reading:

1. Historical
2. Descriptive survey
3. Case study
4. Experimental

EdPsy 518 Interpretation of Psychological Tests for the Reading Specialist 2 s.h.

This course is designed for the graduate student enrolled in curriculums for preparation as Reading Specialists in the public schools to understand, evaluate, and interpret the results of psychological tests accurately and meaningfully.

This objective would be achieved by the use of the following approaches:

1. through an understanding of the principles of text construction.
2. through psychological knowledge of the behavior being measured.
3. through familiarity with the field of available testing instruments.

El 531 Curriculum Problems in Elementary Education 2 s.h.

The curriculum will be studied in relation to local needs and resources. Special attention will be given to contemporary forms of organization and procedures for curriculum development. A student will concentrate his studies on a specific problem of area interest.

El 541 Special Problems in Elementary Social Studies 2 s.h.

The content of the social studies in the elementary school as it contributes to world understanding and the American cultural heritage will be included in this course. Each student will concentrate his studies on a special problem or area of interest. (Mott)

El 542 Arithmetic in the Elementary School 2 s.h.

An overview of the development of arithmetic as a part of the elementary school curriculum will be presented. It will emphasize curriculum development based upon research in arithmetic, special problems in the teaching of arithmetic and the literature which should be known to a teacher of arithmetic. Prerequisite: The Teaching of Arithmetic. (Mathematics Staff)

El 543 Resource Materials in Elementary Science 2 s.h.

This course is designed to give the elementary teacher experience with the literature, equipment, and materials used in teaching science in the elementary school. References dealing with experiments, demonstrations, and identification of plants and animals will be studied. Experiments and demonstrations will be emphasized. Science kits will be prepared which contain basic equipment that may be used in classroom situations. Field trips will be taken to observe materials in real life situations. Given in summer school only. (Science Staff)

El 544 Recent Trends in Elementary Language Arts 2 s.h.

This course will deal with trends, problems, and recent contributions of research in the language arts. Areas will include elementary English, spelling, penmanship, and children's literature. Each student will concentrate his studies on a special problem or area of interest.

El 545 Experiment Studies in Art Education 2 s.h.

Teachers will undertake art experiences in various media as they are adapted to the provision of art experiences for the child. Emphasis will be placed on the stages of growth, type of motivation, and ways of administering stimuli. The class will study the exceptional child to learn to recognize and encourage evidences of art potential as well as wholesome self-expression. (Art Staff)

El 546 Modern Procedures and Skills in Elementary Music 2 s.h.

The purpose of this course is to provide the elementary teachers with new developments and techniques recommended for music education. (Music Staff)

El 547 Resources Materials in Children's Literature 2 s.h.

This course will be concerned with the selection and evaluation of children's literature as a resource for teaching and learning. Although traditional and modern literature in prose and poetry will be considered, much emphasis will be given to non-fiction. Ways will be studied to use these materials in the elementary school program.

El 548 Creativity and the Elementary School Child 2 s.h.

This course will explore ways to uncover creative abilities in children and techniques to direct these energies in the classroom situation. The role of the teacher as the developer of these abilities will be stressed.

El 549 Methods and Materials in Pre-School Education 2 s.h.

Equipment, materials, the curriculum, and methods to be used with the pre-school child will be studied. Characteristics of children of this age will be included as well as methods to maintain family, school, and community public relations.

El 550 The Community and the Elementary School 2 s.h.

Included in this course will be principles and practices of developing and maintaining good school-community relationships, commun-

cations media, and the use of lay personnel. The use of resource persons and the community itself as aids to enrichment will be reviewed.

El 551 Recent Innovations in Elementary Education 2 s.h.

Students will study newer trends in classroom procedure, equipment, and materials as well as problems involved in the improvement of instruction. Whenever possible laboratory sessions will be held to demonstrate and use recently developed materials. Field trips may be used.

El 552 Evaluating the Elementary School 2 s.h.

This course will be concerned with the evaluation of the elementary school, its curriculum, the professional and non-professional staff, and the community as an educational agency. Emphasis will be on self-evaluation. Evaluation will be directed in terms of established educational objectives.

El 553 Supervision and the Improvement of Instruction in the Elementary School 2 s.h.

This course will deal with principles and techniques of supervision in the elementary school. Objectives of the program and the role of the supervisor must be defined. The personal help of the supervisor and the management of equipment and personnel will aim toward the improvement of instruction.

El 554 Administration of the Elementary School 2 s.h.

Principles and techniques of elementary school administration will be studied. Leadership qualities, training and experience background, and human relationship qualities will be reviewed. The administrator will be viewed as a leader of teachers, children, non-professional staff and the community to develop and maintain the best educational plant possible.

El 555 Advanced Human Development and Learning 2 s.h.

This course will be concerned with the recent literature and experimental works in the field of learning. Studies will be limited to the pre-school and elementary school child. Characteristics of the learner, the learning situation and motivation will be stressed.

El 577 Supervised Internship 2 s.h.

The students selected for this program receive continuing individualized guidance and supervision from an intern consultant during their semester of internship.

(Registration only by permission of Graduate Committee)

El 578 Seminar in Elementary Education Internship 2 s.h.

Consultants who are specialists in their fields will be invited to discuss with interns problems related to their intern teaching or work experience.

(Registration only by permission of Graduate Committee)

El 579 Independent Study in Elementary Education 2 s.h.

Students will select one or more topics which are of critical importance in Elementary Education and will meet the staff members for independent reading, study, analysis, and evaluation.

(Registration only by permission of Graduate Committee)

El 580 Seminar in Advanced Research 2-4 s.h.

Enrollment in this course will be by special application only and will be limited to the advanced post-master's student. Most work will be on an individual or small seminar basis with staff and will be concerned with readings, research, and evaluation of proposed research.

Internship In Elementary Education

For a limited number of Elementary Education graduates Indiana University of Pennsylvania is providing an internship program leading to the Master of Education degree.

The participant must first complete a Bachelor's degree in Elementary Education and hold a teaching certificate. He will enroll for a full summer of graduate study. During the following academic year he will spend one semester as a full-time professional teacher in a selected school system; during the other semester he will be a full-time graduate student on the Indiana campus. The second summer will be spent in completing the Master of Education requirements.

While the teacher is employed as a full-time professional teacher in a selected school system, he will have conferences on his professional work progress with a specialist from the University in which there will be a review of his work as a teacher. The (intern) teacher will be paid by the school district for one-half year at the usual rate for a professional teacher in that position.

The course work taken during the two summer sessions and the one full semester will meet the requirements for the Master of Education degree in elementary education and will fulfill permanent certification requirements.

For information regarding the fifth-year internship program for the Master's degree in elementary education, interested persons should write to Chairman of the Elementary Education Department, Indiana University of Pennsylvania, Indiana, Pennsylvania 15701.

THE DOCTORATE IN ELEMENTARY EDUCATION

Admission to the Program of Advanced Graduate Studies

Admission must be secured before a student may proceed further toward the Ed.D. degree. **Full admission** may be granted only to an applicant who has achieved a grade average of "B" (3.0) during his junior and senior undergraduate years in his major area and in all courses taken, and who has received a minimum total score of 1000 on the Graduate Record Aptitude Test (verbal and quantitative).

Departmental Screening

After admission to the Graduate School and after the completion of six to fifteen hours of work beyond the Master's degree the doctoral aspirant must apply for departmental screening. Through screening the major department makes a decision to approve or disapprove further efforts by the student toward completion of the doctorate.

Plan of Study

Following a favorable screening by the major department the student should submit a Plan of Study to the major adviser. Forms for this purpose are available in the Office of the Graduate Dean.

Change in Plan of Study

Any changes from the original plan must be approved in writing by the major adviser and the Dean of the Graduate School. Forms for this purpose are available in the latter's office.

Doctoral Committee

The doctoral committee is appointed by the Graduate Dean upon recommendation of the major department. The Plan of Study is then submitted for approval. This committee serves throughout the student's doctoral program as an examining body and for consultation and help during the research and preparation of the dissertation.

Internship Requirement

Ordinarily, an internship will be required for a period of one semester. This internship will provide first-hand experience in an educational program outside of the type of institution in which the student previously worked. Students with extensive leadership experience may be assigned short internships during which they will be expected to carry out research projects in their special interest areas.

Arrangements for a variety of internship might be made with industry, school systems, or with other agencies, on an individual basis. The nature of the internships must be consistent with requirements and interests in cooperating educational institutions.

The internship experiences must be in harmony with the student's program and job goals. The student must be assigned specific tasks and be supervised by a regular staff member of the university, preferably his major adviser or a member of his doctoral advisory committee.

Each intern will maintain a log or diary of his activities which will be reviewed and analyzed for the purpose of evaluating the internship experience.

Candidacy

Prior to admission to candidacy, the student will be expected to prepare and secure committee approval of a prospectus describing his proposed internship experience(s). The prospectus should clearly state, for each experience:

- A. The name of the institution or organization in which experience is sought.
- B. The name of persons who will assign tasks and supervise the intern's performance.
- C. The period of time to be spent in this experience.
- D. A brief definition of the learning goals to be sought during this experience, including
 1. Cognitive goals—knowledges the intern expects to acquire
 2. Psycho-motor goals—skills the intern expects to develop
 3. Affective goals—attitudes, values and beliefs the intern expects to change or alter as a result of the internship experience
- E. The means by which the intern expects to achieve the above goals. (Activities and projects with which he will be involved and persons with whom he will come in contact.)
- F. The evaluative procedures which might be employed to determine whether the goals have been achieved.

Comprehensive Examinations—Written

After filing the Plan of Study, receiving notification of the appointment of a committee, and the completion of forty-five semester hours of the program (including the Master's degree), the student may apply for written examinations. Approval of the major professor is required. Application forms are available in the Office of the Graduate Dean and must be filed at least one month before the scheduled testing date as noted in the calendar of the Annual Bulletin.

The comprehensive examinations are administered by the major department; both major and related fields are represented.

For the degree in Elementary Education the major adviser submits a report after consultation with faculty representatives from the related areas who submitted questions. The committee will notify the student and the Graduate Dean of the outcome of the written examinations.

Comprehensive Examinations—Oral

After the written comprehensive examination is passed the oral examination is scheduled by the major adviser. The oral comprehensive examination is conducted by the student's doctoral committee.

Research Requirements

Certain research requirements must be satisfied before the preliminary plan for dissertation research is presented to the doctoral committee. Any one of the following form options may be used to satisfy research requirements:

- 1) Two courses in research methods plus two graduate courses in statistics.
- 2) Two graduate courses in statistics, one course in computer science and one course in research methods.
- 3) One foreign language (6 hours) plus one course in research tools and one graduate course in statistics.
- 4) Three graduate courses in statistics and one course in research methods.

Review of Research Proposal

The purpose of the dissertation proposal meeting is explained in the following statement addressed to doctoral committee members:

The purpose of the meeting is to approve or disapprove the dissertation proposal, to offer guidance to the student and to make comments, suggestions, and recommendations which the committee feels will assist him.

The committee is expected to reach a clear-cut decision to approve or disapprove the proposal study as presented. If the proposal is accepted, no further meeting of the committee is necessary. If the alterations required by the doctoral committee are so basic or extensive as to necessitate another committee meeting or further approval by members of the committee, the action recommended should be to disapprove the proposal. If the proposal is disapproved, a subsequent meeting of the student and the full committee is required.

The preliminary plan for doctoral research must be approved by the major professor before a request for a committee meeting may be submitted. The student should deliver not later than two weeks in advance of the scheduled meeting one copy of the proposal to each of his doctoral committee members.

Approval of the committee signifies that, in its opinion, the candidate is ready to begin full-time research on the dissertation without extensive revision.

When the preliminary plan is presented to the committee, the student should be thoroughly familiar with his topic and its relationship to existing research. His knowledge of bibliography in his area of study should be sophisticated and should be so reflected in the proposal.

Tests, scales, and other instruments employed in the study should have some demonstrated reliability and validity. Where such instruments are incidental to and constructed especially for the proposed research, supporting information should be provided in the dissertation proposal.

Dissertation Review Meeting

When the dissertation is completed it must be submitted to the Office of the Graduate Dean. One unbound copy must be supplied each member of the advisory committee at least two weeks before the final review. During these two weeks the Graduate Dean and members of the doctoral committee read the dissertation.

The final review is of the dissertation and of the general area to which it relates. Approval by the committee signifies that the dissertation is ready for publication without alteration. In review the committee will be concerned with ideas and the candidate's defense of same. In addition, the candidate is responsible for form, style, structure and technical accuracy. It is the candidate's responsibility to make certain that the dissertation is accurate in every detail prior to submitting the dissertation for review.

SUMMARY FOR PROCEDURES FOR DOCTORATE IN ELEMENTARY EDUCATION

Procedure	Time Element
1. Apply for admission to the Graduate School and for permission to enroll for advanced graduate studies.	After completion of the Master's degree
2. Apply for departmental screening, which serves as an evaluation of candidacy.	Before completion of 45 graduate hours
3. Channel program of studies toward either the Doctoral degree or the specialist's program.	At completion of 45 graduate hours
4. If the specialist's program is chosen, select courses in area of concentration.	45-60 graduate hours
5. If admitted to doctoral studies, present Plan of Study to the major adviser. The doctoral committee approves Plan of Study.	After departmental screening
6. Submit internship prospectus.	After committee is appointed
7. Apply for comprehensive examinations.	45-60 graduate hours
A. Schedule written comprehensive examination.	Given only in November, March, and July
B. Schedule oral comprehensive examination.	After written examination is passed
8. Complete research skill requirements.	Before submission of dissertation proposal
9. Schedule dissertation meeting for approval or rejection of proposal.	After comprehensive examinations
10. Schedule final review of dissertation and internship experience.	Send one copy to Dean's office two weeks before meeting
11. Apply for graduation.	Two months prior to nearest commencement following acceptance of dissertation

THE SPECIALIST CERTIFICATE PROGRAM IN ELEMENTARY EDUCATION

The specialist's certificate program requires two years of study beyond the Bachelor's degree and affords the student an opportunity to prepare in depth for a variety of positions in education.

The present policies of the Graduate School of the University require that students hold a Master's degree before applying for admission to the specialist's degree program. The specialist's degree, thus, requires a minimum of sixty semester hours of graduate credit beyond the Bachelor's degree or a minimum of thirty semester hours of credit beyond the Master's degree. The program outline that follows, therefore, assumes a student has completed the Master's degree program in elementary education in graduate credits earned from an accredited institution.

Specialist's Certificate Program will require sixty semester hours of work, including:

- a. Four courses (or eight hours) in Elementary Education Curriculum and Supervision.
- b. Four courses (or eight hours) in one special field of concentration.

c. All students must schedule the course El 579—Independent Study in Elementary Education. In this course the student will prepare a paper on a practical aspect of education. The subject for this paper will be agreed upon by both the student and his departmental adviser.

In this portion of the program the student, with the guidance of his adviser, will plan a program of courses designed to fit his particular purposes. Such courses will be selected from the total offerings of the University. The most likely general objectives of students will be in one of the following:

- A. Course selection to build a special area of competency such as curriculum development, supervision or instructional improvement.
- B. Course selection to build two specialities such as indicated in A above.
- C. Course selection focused on preparation for a particular professional job such as curriculum coordinator, assistant superintendent in charge of instruction, or director of elementary education.
- D. Course selection intended to provide a broad base of curricular experience in curriculum and supervision (the generalist in this educational specification).

ENGLISH

Craig G. Swauger, Chairman
William F. Grayburn, Director of Graduate Studies

William W. Betts, Jr.
Lorrie J. Bright
R. Morrison Brown
David M. Cook
Harry E. Craig
Malcolm Day
Robert W. Ensley
James R. Green
Harry Haldeman
Jackson Heimer

Raymona E. Hull
Lawrence A. Ianni
Dorothy F. Lucker
Margaret Omrcanin
Maurice L. Rider
Helena M. Smith
Ford H. Swigart
Vincent Tartella
Raymond L. Thomas

A candidate for a Master's degree in English may choose a program leading to either the Master of Education or the Master of Arts. The choice will depend on the background of the candidate and his purpose in pursuing graduate study. Both programs share a common aim of increasing the candidate's knowledge of English language and literature and introducing him to the discipline of advanced study.

After a student is admitted to the graduate school he will be assigned an advisor who will consult with him about the scheduling of courses.

I. Research Requirements

Candidates for both the Master of Arts and the Master of Education degrees in English will enroll in Eng. 510 (Bibliographical Methods in English—2 hrs.), as a first or a very early course in their degree programs.

A thesis is required of all Master of Arts candidates, who will register for from two to four (2-4) semester hours of Grad. 550. The thesis proposal will be reviewed by a departmental committee assigned by the director of graduate studies. After approval, the candidate will write the thesis under the direction of his thesis committee chairman and present himself for an oral examination after it has been completed.

A Master of Education degree candidate may choose to satisfy the research requirement by a thesis under the same conditions as those for the Master of Arts degree, or he may choose to schedule four additional hours of course work and submit a Research Project approved by the Director of Graduate Research and a project chairman.

II. Subject Matter Concentration

The following list of courses will provide the content studies for programs in both the Master of Education and the Master of Arts degrees.

From this list the M.A. candidates will choose from eighteen to twenty-four (18-24) hours; the M.Ed. candidates will choose from sixteen to twenty (16-20) hours, depending on the options elected for research, professional studies, or related studies.

Courses numbered "600" are seminars designed primarily for the advanced graduate student. Students working for the M.A. or M.Ed. degree are encouraged to schedule "600" courses, on approval of the instructor, to help meet subject-matter requirements. Seminars may be scheduled more than once, because subject matter will change with each offering of the course.

Eng	512	American English Grammar	3 s.h.
Eng	513	The English Language from the Beginnings to 1500	3 s.h.
Eng	514	The English Language since 1500	3 s.h.
Eng	515	Shakespeare I	3 s.h.
Eng	516	Shakespeare II	3 s.h.
Eng	517	Elizabethan Drama	3 s.h.
Eng	520	Old English Literature	3 s.h.
Eng	521	Modern European Fiction	3 s.h.
Eng	522	Chaucer	3 s.h.
Eng	525	The Early English Drama	3 s.h.
Eng	527	Restoration and Eighteenth Century Drama	3 s.h.
Eng	528	Milton	3 s.h.
Eng	532	Colonial American Literature	3 s.h.
Eng	534	Types of the Novel	3 s.h.
Eng	535	Criticism	3 s.h.
Eng	536	Middle English Ballads, Lyrics, and Romances	3 s.h.
Eng	537	Modern American Fiction	3 s.h.
Eng	539	The Metaphysical Poets	2 s.h.
Eng	540	Twentieth Century American Drama	3 s.h.
Eng	541	The Rise of American Regionalism	3 s.h.
Eng	543	The British Novel of the Eighteenth Century	3 s.h.
Eng	544	The Psychology of Language	3 s.h.
Eng	545	The Age of Pope	3 s.h.
Eng	546	The Age of Johnson	3 s.h.
Eng	547	Romantic Prose and Poetry	3 s.h.
Eng	548	Victorian Prose and Poetry	3 s.h.
Eng	551	Twentieth Century British Novel	3 s.h.
Eng	552	Twentieth Century British Drama	3 s.h.
Eng	553	The American Renaissance	3 s.h.
Eng	554	Contemporary American and British Poetry	3 s.h.
Eng	555	Realism in American Fiction	3 s.h.
Eng	556	Modern British Poetry	2 s.h.
Eng	557	Modern American Poetry	2 s.h.
Eng	561	Tragic Themes of Classic Drama	3 s.h.
Eng	562	Epic and Lyric Poetry of the Classical Period	3 s.h.
Eng	565	The Faust Literature	2 s.h.
Eng	570	Major Writers: Hawthorne and Thoreau	2 s.h.
Eng	571	Major Writers: Faulkner and Hemingway	2 s.h.
Eng	572	Major Writers: Thomas Hardy	2 s.h.
Eng	573	Major Writers: Whitman	2 s.h.
Eng	574	Major Writers: Poe	2 s.h.
Eng	575	Major Writers: Henry James	2 s.h.
Eng	576	Major Writers: Joseph Conrad	2 s.h.
Eng	577	Major Writers: Emerson	2 s.h.
Eng	578	Major Writers: Edmund Spenser	2 s.h.
Eng	579	Major Writers: Alexander Pope	2 s.h.
Eng	580	Major Writers: Samuel Johnson	2 s.h.
Eng	581	Major Writers: Jonathan Swift	2 s.h.
Eng	582	Major Writers: Wordsworth and Coleridge	2 s.h.
Eng	583	Major Writers: Byron, Keats, and Shelley	2 s.h.
Eng	584	Major Writers: Tennyson and Browning	2 s.h.
Eng	585	Major Writers: Charles Dickens	2 s.h.
Eng	586	Major Writers: D. H. Lawrence	2 s.h.
Eng	587	Major Writers: W. B. Yeats	2 s.h.
Eng	588	Major Writers: G. B. Shaw	2 s.h.
Eng	589	Major Writers: Herman Melville	2 s.h.
Eng	590	Major Writers: Mark Twain	2 s.h.
Eng	591	Major Writers: Frost and Robinson	2 s.h.
Eng	592	Major Writers: T. S. Eliot	2 s.h.
Eng	593	Major Writers: Fitzgerald and Lewis	2 s.h.
FL	521	Language and Society	2 s.h.

Eng	600	Seminar in British Literature to 1500	3 s.h.
Eng	610	Seminar in British Literature— Renaissance (1500-1660)	3 s.h.
Eng	620	Seminar in Shakespeare	3 s.h.
Eng	630	Seminar in British Literature—Restoration and Eighteenth Century (1660 to 1800)	3 s.h.
Eng	640	Seminar in British Literature— Nineteenth Century (to 1870)	3 s.h.
Eng	660	Seminar in Modern British Literature (from 1870)	3 s.h.
Eng	670	Seminar in American Literature to 1870	3 s.h.
Eng	680	Seminar in Modern American Literature (from 1870)	3 s.h.
Eng	690	Seminar in Literary Criticism	3 s.h.
Eng	695	Seminar in Linguistics	3 s.h.

III. Special M.Ed. Requirements

In addition to satisfying the general policy for admission to the Graduate School, the M.Ed. candidate must possess a Pennsylvania Teacher's Certificate in English or its equivalent from another state.

Professional Studies

The M.Ed. candidate will take from two to six (2-6) hours from the following list of courses:

Eng	511	Seminar in the Teaching of English in the Secondary School	2 s.h.
Eng	550	Workshop in Play Production	6 s.h.
Eng	568	Teaching Composition in the Secondary School	2 s.h.
Eng	569	English Institute	6 s.h.
LRes	500	Seminar in Learning Resources	2 s.h.
Grad	516	Statistical Methods I	2 s.h.
Psy	531	Psychology of the Exceptional Child	2 s.h.
Psy	532	Studies in Pupil Adjustment	2 s.h.

Foundations of Education

Two (2) semester hours of work must be selected from the following courses:

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

IV. Special M.A. Requirements

Foreign Language

The candidate for the M.A. degree must show a proficiency in a single language besides English. This language may be one of the modern foreign languages or a classical language. The proficiency requirement is satisfied by acceptable undergraduate credit of 12 hours in the language or by satisfactory performance on an examination administered by the Foreign Languages Department at Indiana.

Related Studies

The M.A. candidate may apply a maximum of six hours in a single related field (such as history, philosophy, psychology or other areas approved by his advisor) toward satisfying his requirement of twenty-four hours of subject-matter courses (see II above).

The program leading to the Doctor of Philosophy degree in English and American literature is designed for those who wish to teach at the college or university level. A candidate for this degree is

expected to acquire a broad knowledge in limited areas of study, and show through the completion of an acceptable dissertation the ability to conduct an independent investigation of a topic approved by the department. To become a candidate the applicant must meet all the Graduate School requirements for candidacy, as well as the special requirements of the English department. Admission to course work beyond the Master's degree does not constitute admission to candidacy for the Ph.D. program. No specific number of course credits entitles a student to the degree, but a minimum of sixty semester hours of credit, exclusive of research credits, must be earned beyond the Bachelor's degree. Applications for candidacy will be reviewed by a departmental candidacy committee after six hours of graduate credit have been earned beyond the Master's degree and before twelve hours have been completed. The applicant must pass a written candidacy examination based on a departmental reading list. In determining whether or not an applicant should be accepted as a candidate for the degree of Doctor of Philosophy, the committee will consider his performance on the candidacy examination, his scores on the Graduate Record Examination, and his performance in course work.

The foreign language requirements for English candidates must be completed before the comprehensive examination. For those candidates who do not satisfy this requirement by course work, the Foreign Languages Department will administer examinations in French, German, and Latin, or another language approved by the candidate's advisory committee.

Candidates must demonstrate the capacity to teach effectively, either in the departmental teacher-internship program, or through other acceptable teaching experience.

After admission to candidacy, the candidate will be assigned to an advisory committee who will help the candidate prepare a plan of study for a comprehensive examination, which will be offered after the candidate has completed one and one-half years of study. The comprehensive examination will be taken on the recommendation of the advisory committee near the end of course requirements and before registering for Grad. 650, dissertation credits. For the comprehensive examination the candidate will be permitted to select three areas of his choice from eight areas of examination: English Linguistics; British Literature—Beginnings to 1500; Renaissance (1500-1660); Restoration and 18th Century (1660-1800); 19th Century (1800-1870); Modern British Literature (from 1870); American Literature to 1870; Modern American Literature (from 1870). At least two graduate courses are required in each of the above designated areas which he does not select for his examination. Certain graduate courses will be required of all candidates.

On approval of the advisory committee, a candidate may take as many as fifteen graduate hours of course work in a minor field in support of his major research interest.

A complete description of the Ph.D. program in English can be obtained from the English Department or from the Graduate School.

COURSE DESCRIPTIONS

Eng 510 Bibliographical Methods in English 2 s.h.

This course offers the student practical training in the special methods and materials of research in English. Required of all majors in English and should be taken early in the program. (Staff)

Eng 511 Seminar in the Teaching of English in the Secondary School 2 s.h.

A seminar to explore the recent developments in the teaching of high school English. Open only to those holding a certificate to teach English. (Cook, Brown)

Eng 512 American English Grammar

3 s.h.

This course treats the phonology, morphology and syntax of present-day English, with the emphasis on the latter two. The various approaches to the analysis of English syntax are treated, and detailed consideration is given to problems of dialect and standards of correctness. (Green, Ianni, Craig)

Eng 513 The English Language from the Beginnings to 1500

3 s.h.

This course treats the phonology, syntax and lexicon of Old English and Middle English. Facsimile texts are examined as instances of the structure of earlier forms of the English language rather than as literary accomplishments. The purpose is to acquaint the student with earlier forms of the language and to provide background for study of the prose and poetry of Old and Middle English. (Green, Ianni)

Eng 514 The English Language since 1500

3 s.h.

This course presents the syntax and stylistics of the English language from Early Modern English to the present. The various rhetorical styles and theories that have dominated English prose at various periods are examined by the use of exemplary texts and the reading of the works of rhetorical theorists. Theory and performance in respect to diction, figurative language and sentence stylistics will be explored. (Green, Ianni)

Eng 515 Shakespeare I

3 s.h.

The material for this course is, in the main, the literary work of Shakespeare from the beginning of his career to 1600 (excluded are his early tragedies). In addition to the plays themselves (comedies and chronicles) and the scholarship on them, study is directed to the historical and theatrical influences that affected Shakespeare. (Swigart)

Eng 516 Shakespeare II

3 s.h.

This course concentrates primarily on Shakespeare's work from 1600 to his death, the period of the dark or problem comedies, his great tragedies and romances (his three earlier tragedies will be included). Includes advanced study in the scholarship on the plays and the Elizabethan milieu. (Swigart)

Eng 517 Elizabethan Drama

3 s.h.

The material for this course is the English drama, exclusive of Shakespeare, produced from the mid-sixteenth into the early seventeenth century. The rich variety of comedy and tragedy of the period is studied in the works of such writers as Llyly, Greene, Kyd, Marlowe, Dekker, and Jonson, against the historical and social background of the Elizabethan age. (Swigart)

Eng 520 Old English Literature

3 s.h.

This course explores the literary merit of the prose and poetry of the Anglo-Saxons. The universal and particular themes which attracted Anglo-Saxon poets are examined in both epic and lyric poetry, while the prose is considered as a reflection of the cultural values that underlie the English literary tradition. The examination of the Anglo-Saxon literary accomplishment will include some attention to the prosody and diction of the artist, as well as a placement of that accomplishment within the framework of his times. Prerequisite: Eng. 513, The English Language from the Beginnings to 1500.

Eng 521 Modern European Fiction

3 s.h.

This course offers an intensive study in translation of the major fiction writers of the twentieth century exclusive of British and American. The older generation—Proust, Gide, Kafka, and Mann—will be studied in relation to representatives of contemporary Europe such as Camus, Moravia, Silone, and Sartre. (Lucker)

Eng 522 Chaucer 3 s.h.
The major poetical works of Geoffrey Chaucer are studied primarily as literature but with considerable emphasis upon pronunciation, versification, language, and textual problems. (Rider)

Eng 525 The Early English Drama 3 s.h.
The development of the English drama from 900 to 1500, with attention to classical and indigenous influences on specific plays and types of plays, is studied. (Rider)

Eng 527 Restoration and Eighteenth Century Drama 3 s.h.
The British theatre from the Restoration period to Sheridan is studied in connection with the literary, historical, and social developments of the times.

Eng 528 Milton 3 s.h.
This course provides for intensive study in the major prose and poetry of John Milton, with attention to the religious and political controversies of the seventeenth century which are reflected in Milton's work. (Thomas, Rider)

Eng 532 Colonial American Literature 3 s.h.
This course provides a study of significant selections of American literature written prior to the 19th century and develops an understanding of the forces that shaped that literature and had considerable influence on a great portion of American literature that followed, down to the present time. (Cook, Omrcanin)

Eng 534 Types of the Novel 3 s.h.
Standards are established for such genres of the novel as the Historical Romance, the Novel of Ideas, the Novel of Manners, and Satiric Fantasy. English and American novels are read in several of these categories. (Ianni, Omrcanin)

Eng 535 Criticism 3 s.h.
This course confronts the student with the major statements of critical theory from Aristotle onward and places them within a historical context so that the student becomes aware of the evolution of literary standards in western culture. The aims of the course are both historical and aesthetic. (Ianni)

Eng 536 Middle English Ballads, Lyrics, and Romances 3 s.h.
The English and Scottish popular ballads and the lyrics are studied in reference to their origins, literary development, and social significance. The emphasis in the romances is upon the Arthurian legends. (Rider)

Eng 537 Modern American Fiction 3 s.h.
Trends in contemporary American fiction provide a basis for special studies in such figures as Dreiser, Anderson, Fitzgerald, Lewis, Dos Passos, and Wolfe. (Swauger)

Eng 539 The Metaphysical Poets 2 s.h.
The characteristic lyric poets of the seventeenth century from Donne to Cowley are studied in relation to changing social and political conditions. (Bright, Day)

Eng 540 Twentieth Century American Drama 3 s.h.
The contributions of the major dramatists of the twentieth century to the development of the American theater are considered. (Heimer)

Eng 541 The Rise of American Regionalism 3 s.h.
This course considers writers who drew their materials from the culture peculiar to a particular area. Such local colorists as Page, Harte, Harris, and Jewett are read. (Smith)

Eng 543 The British Novel of the Eighteenth Century 3 s.h.
Study of the British novel from Defoe through Jane Austen and the Gothic school, with some attention to narrative prose fiction before the eighteenth century. (Swigart)

Eng 544 The Psychology of Language 3 s.h.
This course is an introduction to psycholinguistics for the specialist in English. It deals with the fundamental ideas about language as a code, the acquisition of language, and the patterns of normal and aberrant human language behavior. (Green, Ianni)

Eng 545 The Age of Pope 3 s.h.
A close examination of the works of Alexander Pope and those of his contemporaries who most strongly influenced the rise of neoclassicism in England during the early 18th century.

Eng 546 The Age of Johnson 3 s.h.
A survey of the major literary tendencies between the death of Pope and the publication of *Lyrical Ballads*. A large portion of the course is devoted to Johnson as a literary figure in his own right.

Eng 547 Romantic Prose and Poetry 3 s.h.
This course concentrates on the revolt against the philosophic, social and aesthetic principles of the eighteenth century as it is revealed in the works of the major poets and essayists of the years 1798 to 1832. (Lucker)

Eng 548 Victorian Prose and Poetry 3 s.h.
This course examines the major social, political, economic, and religious issues in the works of leading poets and prose writers to 1890. (Lucker)

Eng 550 Workshop in Play Production 6 s.h.
The study of various styles of production and of the principles of directing in the preparation of plays for a high school audience. Included are analyses of the script, methods of casting and rehearsal, and the technical aspects of production. The summer theater is used as a laboratory for observation and participation. One day of lecture and library work, four days of laboratory. (Ensley)

Eng 551 Twentieth Century British Novel 3 s.h.
A study of the technique and history of the novel from 1900 to the present. Such figures as Conrad, Lawrence, Forster and Joyce will be read. (Heimer, Omrcanin)

Eng 552 Twentieth Century British Drama 3 s.h.
A reading of plays from the late 19th century to the present, including such older figures as Wilde, Shaw, and Synge, and such contemporary figures as Osborne and Pinter. (Heimer)

Eng 553 The American Renaissance 3 s.h.
The works of the major writers in mid-nineteenth century America. (Grayburn, Hull, Smith)

Eng 554 Contemporary American and British Poetry 3 s.h.
This course provides a close examination of American and British poetry since World War II and the chief influences on that poetry. Poets such as Lowell, Wilbur, Roethke, Larkin, and Hughes will receive particular attention, but much of the study will be directed toward particular "schools": the confessional poets, the "projectivists," the advocates of the "subjective image," the "beats," with the intention of understanding their purposes and their theories of form and idiom.

Eng 555 Realism in American Fiction 3 s.h.
 This course examines the masterpieces of American realistic fiction from the late Romanticists through Mark Twain and to literary Naturalism. (Grayburn)

Eng 556 Modern British Poetry 2 s.h.
 This course provides a close examination of major twentieth century British poets: Hardy, Hopkins, Yeats, Owen, Auden, Spender. (Betts, Heimer)

Eng 557 Modern American Poetry 2 s.h.
 This course provides an intensive critical examination of the major twentieth century American poets from Eliot to the present. (Bright, Heimer, Betts)

Eng 561 Tragic Themes of Classic Drama 3 s.h.
 A study of the structure and themes of the extant tragedies of Greece and Rome, together with the dramatic criticism of the two periods. (Hull)

Eng 562 Epic and Lyric Poetry of the Classical Period 3 s.h.
 A study of the *Iliad*, the *Odyssey*, and the *Aeneid*, together with major writers of Greek and Roman lyric poetry. (Hull)

Eng 565 The Faust Literature 2 s.h.
 The course provides a close study of the Faust tradition in literature and music, with major attention to Marlowe, Goethe, and Gounod. (Betts)

Eng 568 Teaching Composition in the Secondary School 2 s.h.
 The aim of the course is to help secondary school English teachers become better writers themselves and better critics of writing. The course will deal mainly with expository prose. Short essays will be written which the instructor will analyze and criticize for revision. Rhetorical analyses will be made of selections of prose by professional writers. (Staff)

Eng 570 Major Writers: Hawthorne and Thoreau 2 s.h.
 Non-fictional prose of Thoreau compared with Hawthorne's short stories and major novels. (Hull)

Eng 571 Major Writers: Faulkner and Hemingway 2 s.h.
 This course considers the novels and short stories of William Faulkner and Ernest Hemingway, with attention to each writer's influence on modern fiction. (Swauger)

Eng 572 Major Writers: Thomas Hardy 2 s.h.
 Special studies are conducted in the poetry and fiction of a major writer of the late nineteenth century. (Betts)

Eng 573 Major Writers: Whitman 2 s.h.
 Students study *Leaves of Grass* extensively to comprehend its unity of theme and structure, doing detailed analyses of major poems. Whitman's essays which best give insight into his poetical theory and social/political thought are also read. (Smith)

Eng 574 Major Writers: Poe 2 s.h.
 A study of Poe's poetry, fiction, and literary criticism. (Hull)

Eng 575 Major Writers: Henry James 2 s.h.
 This course provides for extensive and analytical reading of short stories, novels and criticism of Henry James with attention to his influence on modern fiction as craftsman and critic. (Omrceanin)

Eng 576 Major Writers: Joseph Conrad 2 s.h.
 Study is concentrated in the seven major novels and in a variety of the short stories of Conrad. (Betts, Heimer)

Eng 577 Major Writers: Emerson 2 s.h.
Emphasis is on the major prose and poetry of Ralph Waldo Emerson, with attention given to other writers of the Concord group. (Grayburn)

Eng 578 Major Writers: Edmund Spenser 2 s.h.
While this course focuses primarily on Spenser's major works—*The Shephearde's Calendar*, *The Amoretti*, *The Epithalamion* and *Prothalamion*, *The Faerie Queen*, and *The Mutabilitie Cantos*—Spenser's unique position as the pre-eminent non-dramatic poet of the English Renaissance necessitates some study of both the Classical and Continental backgrounds of his work and his germinal importance to subsequent English poetry.

Eng 579 Major Writers: Alexander Pope 2 s.h.
Studies in the major work of Pope in such forms as the pastoral, the Horatian epistle, the verse essay, and the mock heroic.

Eng 580 Major Writers: Samuel Johnson 2 s.h.
Studies in Johnson as poet, essayist, novelist, dramatist, critic, biographer, lexicographer, and editor.

Eng 581 Major Writers: Jonathan Swift 2 s.h.
This course examines Swift as both Tory and satirist through a study of the major satires.

Eng 582 Major Writers: Wordsworth and Coleridge 2 s.h.
A close analysis of significant poems by the early Romantics and of critical commentary on their works. (Lucker)

Eng 583 Major Writers: Byron, Keats, and Shelley 2 s.h.
The Romantic characteristics shared by these three poets, as well as the distinguishing characteristics of each writer, are examined by means of close analysis of significant poems. (Lucker)

Eng 584 Major Writers: Tennyson and Browning 2 s.h.
Tennyson and Browning, as they offer a contrast in poetic styles, provide a study in both lyric and dramatic poetry and in the Romantic mode and the modern technique. (Betts)

Eng 585 Major Writers: Charles Dickens 2 s.h.
A study of the major novels by Dickens as they reflect the social problems of the age.

Eng 586 Major Writers: D. H. Lawrence 2 s.h.
A study of the author as creator of fiction, poet and critic. (Heimer)

Eng 587 Major Writers: W. B. Yeats 2 s.h.
A study of the works, especially the poetry, of a leading Irish literary figure. (Betts, Heimer)

Eng 588 Major Writers: G. B. Shaw 2 s.h.
A study of the plays and other writings of a prominent and influential dramatist.

Eng 589 Major Writers: Herman Melville 2 s.h.
The many facets of Melville's prose, fiction and non-fiction, with major emphasis on *Moby Dick*. (Hull)

Eng 590 Major Writers: Mark Twain 2 s.h.
Students read representative books from the various categories of Twain's work: autobiography, travel, historical romances, social criticism, and light fiction. Detailed critical study is given the more significant novels. (Smith, Grayburn)

Eng 591 Major Writers: Frost and Robinson 2 s.h.
 Studies in the lyric and narrative poetry of E. A. Robinson and Robert Frost. (Betts)

Eng 592 Major Writers: T. S. Eliot 2 s.h.
 Studies in the work of T. S. Eliot: the plays, the poetry, the criticism, the nature and extent of his influence. (Betts)

Eng 593 Major Writers: Fitzgerald and Lewis 2 s.h.
 Study of both primary and secondary sources that reveal these two writers as shaped by and shaping the American 1920's. Emphasis will be placed on the writing they did during this period, although their other work will be considered as well. (Cook)

Eng 600 Seminar in British Literature to 1500 3 s.h.
 For advanced graduate students who need either extensive or intensive study in an area not treated by an existing course in the Anglo-Saxon or Middle English period. Subject areas covered by this seminar will be announced in advance each time the course is offered. Prerequisite: At least one graduate course in Old or Middle English. (Como)

Eng 610 Seminar in British Literature—Renaissance (1500-1660) 3 s.h.
 For advanced graduate students who wish to make an intensive or extensive investigation of an area of the English Renaissance that is not currently treated in course work. The subject for each seminar will be announced in advance of registration. Prerequisite: At least one graduate course in the English Renaissance. (Day, Rider)

Eng 620 Seminar in Shakespeare 3 s.h.
 Students are urged to pursue special problems of particular interest in Shakespeare studies. (Prior study in the field is a valuable prerequisite for the course.) Students prepare papers which they read and defend before their colleagues. The emphasis is on individual study and research in primary and secondary sources.

Eng 630 Seminar in British Literature—Restoration and Eighteenth Century (1660 to 1800) 3 s.h.
 This course offers students the chance to pursue special areas of interest within the rich and varied literature of the period. The course, as it is given in different semesters with different teachers, will have changing content and emphases.

Eng 640 Seminar in British Literature—Nineteenth Century (to 1870) 3 s.h.
 This course, for advanced graduate students, provides for independent study in depth of some of the major Romantic and Victorian literary figures. Prerequisite: Either a graduate or an undergraduate course in the period.

Eng 660 Seminar in Modern British Literature (from 1870) 3 s.h.
 Seminars in Modern British Literature study in detail figures, movements, or genres within the span of 1870 to the present. After an introductory lecture, class sessions are devoted to the reading and critical discussion of seminar members' papers.

Eng 670 Seminar in American Literature to 1870 3 s.h.
 A seminar for advanced students in American literature, covering works of major writers in such areas as the Puritan period, the early republic, the Romanticists, and other phases of American literature up to and including the Civil War. Prerequisites: Either course work in American literature to 1870 on the master's level, or an undergraduate course in American literature, plus sufficient individual reading on the part of the student to compensate for inadequate formal course work.

Eng 680 Seminar in Modern American Literature (from 1870) 3 s.h.

A seminar for advanced students, to provide for research and study in depth of selected writers and movements of this period. Research will center upon such subjects as the following: a particular author or group of authors; a literary genre, a literary movement; a restricted period of time, etc.

Eng 690 Seminar in Literary Criticism 3 s.h.

The purpose of this course is to produce through independent study a paper on the aesthetics of literary expression. The student investigates theories of literature as expressed by the great critics from Aristotle to the present. In the paper he can either formulate and attempt to validate some original hypothesis of his own about the nature of literature or explore the labors of some critic or critics in applying their principles to the judgment of literature. The course provides a framework for the specialist in literature to do historical and theoretical research in literature as art. (Ianni)

Eng 695 Seminar in Linguistics 3 s.h.

The course includes topics on the phonology, grammar, and semantics of English past and present, to provide the stimulus for independent study in depth on some specific topic regarding the nature of the English language. Prerequisite: Eng. 544, The Psychology of Language and Eng. 512, American English Grammar. (Green, Ianni)

Eng 696 Seminar in the Teaching of College English 3 s.h.

This course examines the various professional and pedagogical aspects of teaching college English as revealed by current practices and the changes suggested by research. Study is made of materials and techniques of teaching freshman composition, advanced composition, and introductory literature, as well as upper level courses. Topics for discussion include participation in professional societies and the administration of college English departments. Required of doctoral candidates. (Staff)

FOREIGN LANGUAGES

Charles W. Faust, Acting Chairman
Herbert E. Isar, Director of Graduate Studies

José M. Carranza
Antonio M. Guardiola

Arthur A. Leone
Cruz Mendizábal

David L. Shields

CURRICULUM FOR MASTER OF EDUCATION DEGREE (SPANISH)

Students working for this degree will complete thirty (30) semester hours and a research project. A minimum of eighteen (18) semester hours in subject matter content (i.e., Spanish) must be included, unless the candidate elects FL 525. In that case, a minimum of twelve (12) semester hours in Spanish will be required. A reading knowledge of French or of a second foreign language acceptable to the Department must be demonstrated before the student is admitted to candidacy for the degree with a major in Spanish.

I. Subject Matter Concentration Area—FL 525 and twelve (12) semester hours or eighteen (18) s.h., minimum, but vide infra.*

Span	510	History of the Spanish Language	2 s.h.
Span	511	Stylistic Studies	2 s.h.
Span	512	Advanced Composition and Conversation	2 s.h.
Span	520	Medieval Spanish Literature	2 s.h.
Span	521	Seminar on Cervantes	2 s.h.
Span	522	Seminar on Pérez Galdós	2 s.h.
Span	523	Seminar in the Generation of 1898	2 s.h.
Span	524	Hispanic Poetry since 1888	2 s.h.
Span	525	The Spanish Novel after the Civil War	2 s.h.
Span	530	Hispano-American Authors (Social Themes)	2 s.h.

II. Related Studies

Eng	521	Modern European Fiction	2 s.h.
Eng	544	Seminar in the Psychology of Language	2 s.h.
FL	521	Language and Society**	2 s.h.
FL	525	Foreign Study (Valladolid) (optional)	6 s.h.
Geog	527	Mexico, Middle America and West Indian Islands	2 s.h.
Geog	528	South America	2 s.h.
Hist	542	Contemporary Latin American Problems	2 s.h.
Anth	592	Comparative Cultures***	2 s.h.
Anth	593	The Science of Culture	2 s.h.

III. Foundations of Education—two (2) semester hours of work selected from:

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

IV. Research Techniques—the following course is required. It should be scheduled early in the student's program but not as the first (graduate) course.

Grad	515	Elements of Research	2 s.h.
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*If undergraduate credits were obtained for study at the University of Valladolid, FL 525 cannot be taken, and the candidate will satisfy requirements by taking thirty credits (eighteen in Spanish) at the Indiana University of Pennsylvania.

**Cannot be taken if candidate received undergraduate credit for Ling. 421.

***Prerequisite: Introductory Anthropology on the undergraduate level.

**COURSE DESCRIPTIONS IN THE MASTER'S DEGREE
CURRICULUM WITH CONCENTRATION IN SPANISH****FL 521 Language and Society**

2 s.h.

The work of this course is designed to acquaint the student with the salient facts of language and its fundamental role in the development and continuity of society and culture. Some points considered are: language families and their characteristics, factors of linguistic change and development, reciprocal influences of culture and language, linguistic borrowing, psycholinguistics, and systems of writing. (Open to non-majors and majors)

FL 525 Foreign Study (optional)

6 s.h.

Intensive study of the Spanish language and culture at the University of Valladolid, Spain, from approximately February 1 to July 1. For a detailed description vide the annual Indiana University publication, **THE PENNSYLVANIA-VALLADOLID STUDY IN SPAIN PROGRAM**.

NOTE: In the case of candidates for an advanced degree in a field other than Spanish, the 6 credits earned in FL 525 can be applied toward the Master's Degree at Indiana University, representing elective credits.

FL 525 is of exceptional interest and value to persons who have begun the teaching of Spanish in recent years.

In addition to the annual Indiana University of Pennsylvania publication, **The Pennsylvania-Valladolid Study in Spain Program**, vide the annual pamphlet, **Curso de estudiantes norteamericanos de la "Indiana University of Pennsylvania"**, printed by the Facultad de Filosofía y Letras (School of Arts and Sciences), University of Valladolid, Spain. (The latter publication is available at the office of the Program Director, Dept. of Foreign Languages, Indiana University of Pennsylvania.)

Span 510 History of the Spanish Language

2 s.h.

The development of Castilian (phonological, morphological, semantic and syntactic) from the earliest written records to the present time; dialects and dialect geography, particularly in Spanish America; vocabulary borrowing as indicative of cultural imports.

Span 511 Stylistic Studies

2 s.h.

Intensive and detailed analysis of selected modern prose works, preferably the novel and essay, with emphasis upon the study of syntax, idiomatic elements, and colloquialisms. Written and oral reports in Spanish.

Span 512 Advanced Composition and Conversation

2 s.h.

This course stresses the acquisition of fluency in speech and accuracy in written work in Spanish. Supervised teaching on the part of the graduate student in the course will develop poise while intensifying the ability to speak with ease and to correct mistakes in writing.

Span 520 Medieval Spanish Literature

2 s.h.

Study of representative texts from the origins through the fifteenth century, the epic, the chronicle, the theater, the ballad. The **Cantar de Mio Cid**, **Auto de los Reyes Magos**, and the Roncesvalles fragment will be dealt with in depth; significant portions of other items will be read.

Span 521 Seminar on Cervantes

2 s.h.

Analysis of the thought and style of Cervantes, with special emphasis on the **Quixote**.

Span 522 Seminar on Pérez Galdós

2 s.h.

Analysis of the spiritual orientation (e.g., Christian existentialism), thought, and style of the author, notably in his **Novelas Contemporáneas**. Oral and written reports in Spanish.

Span 523 Seminar in the Generation of 1898

2 s.h.

Intensive study of the historical and ideological significance and literary contribution of the galaxy of writers known as the Generation of '98, notably Unamuno, "Azorín", Benavente, Baroja, Ortega, and Blasco Ibáñez.

Span 524 Hispanic Poetry since 1888

2 s.h.

Rubén Darío and the rise of **modernismo** in Spain and Spanish America; poetry and the Generation of '98; reactions against **modernismo**.

Span 525 The Spanish Novel after the Civil War

2 s.h.

Detailed analysis of the impact of the Spanish Civil War in its triple consideration as an ideological, political, and social conflict, on the novel and the subsequent evolution of Spanish narrative. Significant works by Cela, Gironella, Laforet, Delibes, Quiroga, Matute, and Goytisolo will be read. Oral and written reports in Spanish.

Span 530 Hispano-American Authors (Social Themes)

2 s.h.

Study of the most significant texts from colonial times to the present, the chronicle, poetry, essay, and especially the modern novel as the main exponent of the problems confronting Spanish-American society.

Note that all courses, except FL 521, are conducted in Spanish.

GENERAL SERVICES COURSES

A. Courses offered by the School of Education George A. W. Stouffer, Jr., Dean

Ed 522 Principles and Practices in Speech Improvement 2 s.h.

This course will provide for a study of the normal development of speech, classroom methods in speech improvement, and special consideration for children handicapped in speech or hearing. Library research, project work, demonstrations and experimentation will be heavily stressed.

Ed 540 Supervision and Student Teaching 2 s.h.

Designed for supervising teachers and others working with student teachers, this course provides opportunity for the development of pertinent materials and for continuous evaluation of various aspects of the student teaching program. Stress is also given to evaluate procedures used in working with prospective teachers. Basic principles underlying an effective student teaching program are examined from a theoretical and applied viewpoint. Prerequisite: Teaching certificate and teaching experience.

Ed 599 International Education Studies Program 2 s.h.

A travel-seminar conducted in a foreign country and designed to afford educators and students of education the opportunity to investigate the teaching-learning process in cultural settings other than their own. Particular attention will be paid to such current educational issues as theories of curriculum development, methodology, teacher education, and changing value systems.

B. Courses offered by Foundations of Education Don-Chean Chu, Acting Chairman

FdEd 511 Historical Foundations of Education 2 s.h.

A study of the historical development of American education. European influences of the philosophies and practices of American schools will serve as a background for the course. Emphasis will be placed on the development of education in America as influenced by various individuals and schools of thought. Historical trends will be related to current problems and practices in education.

FdEd 512 Philosophical Foundations of Education 2 s.h.

The development of principles upon which to base instruction, recent developments in scientific methodology, and theories of curriculum and school organization will be considered in this course. Stress will be placed upon the essential phases involved in building an individual working philosophy of education.

FdEd 513 Social Foundations of Education 2 s.h.

This course will deal with those social and cultural forces which influence education and the ways in which education has been affected by them. Particular stress will be placed upon current problems as they relate to the entire educational system and to curricular problems and practices in today's schools.

C. Research

George W. Wiley, Assistant Dean of the Graduate School for Research

Grad 515 Elements of Research 2 s.h.

Selection of a research problem, collection of data, types of research, the research report, and the use of the library in connection with the research problems will be studied. Elements of statistics are introduced. This course provides background for the preparation of the thesis or research project, and enables the student to become an intelligent consumer of the products of educational research. As part

of the requirements for this course the student will prepare a written plan for a research project or thesis.

NOTE: Some sections of Grad 515 are taught by departments exclusively for their majors. Students should check with their department chairmen before scheduling Grad 515.

Grad 550 Thesis or Recital

2-4 s.h.

Students writing a thesis for credit will register for this course. Grad 550 should be scheduled for the semester that the student plans to have his final thesis meeting (See step 18, p.).

Recital: Graduate students in music education may prepare and perform a formal recital under the guidance of their private teacher in their major performing area. Approval for the presentation of a recital in lieu of the thesis must be secured from the graduate committee of the Music Education Department. A student should secure approval for this event early in his graduate program, but the actual performance of the recital should occur close to the end of his graduate program.

Grad 650 Dissertation

to be arranged

Students preparing a doctoral dissertation for credit must register for this course. The number of credits assigned and the extent of time for which the research activity is scheduled depend upon the nature and scope of the individual student's research problem as well as his total doctoral program.

D. Statistics

Melvin Woodard, Chairman of Department of Mathematics

Grad 516 Statistical Methods I

2 s.h.

Consists of measurement and statistical techniques as used in teaching, school administration, and common educational research. The basic descriptive statistics, including measures of central tendency, variability and correlation will be developed. The reliability and validity of test scores will also be discussed. Emphasis will be placed upon the use of the statistical techniques studied and their interpretation.

Grad 517 Statistical Methods II

2 s.h.

Advanced statistical devices for educational research workers. The basic concepts of statistical inference and prediction will be developed, including regression and prediction, hypothesis testing, analysis of variance, and partial and multiple correlation. Emphasis will be placed upon the use of interpretation of the techniques studied. Prerequisite: Grad 516 or equivalent.

GEOGRAPHY

Thomas G. Gault, Chairman
Maurice M. Zacur, Director of Graduate Studies

Mamie Anderzhon
Donald J. Ballas
Gopal Kulkarni
Isadore R. Lenglet
Michael Lukas

Vincent P. Miller, Jr.
James E. Payne
William C. Warren
Charles E. Weber
David C. Winslow

The pursuit of a Master's Degree with a major in Geography presupposes that certain subjects normally included in the undergraduate major in geography have been successfully completed. The department, however, will accept applicants with limited background in Geography with the understanding that deficiencies will be made up, either through extra course work or through a personal reading program.

The Department invites students with a limited geography background to extend their general education through enrollment in geography as a related area. Students in Elementary, Social Sciences, Science, or Business may find Geography courses closely related to their fields. The minimum prerequisite for entering all graduate geography courses is undergraduate World Geography (Geog. 101 or its equivalent).

Courses numbered above 540 (except 589 and 590) have a prerequisite of six semester hours of geography and are not recommended for other than geography, social science, or science majors, but may be taken with written permission from the chairman of the department. Courses numbered above 590 require a prerequisite of 18 hours of geography.

The degree which a student should pursue will depend upon the personal objectives and the goal of the individual. The Master of Education (M.Ed.) degree is professionally oriented toward teaching as a career. The M.Ed. degree does not necessarily connote preparation for further study toward the doctorate.

The Master of Arts and Master of Science degrees are designed with knowledge of subject matter as the objective rather than its application to professional use. Although these degrees are complete programs they are also designed as preparation for further study toward the doctorate. The Master of Arts and Master of Science degree differ both in their programs and in the background required.

The Master of Arts degree is designed for the student who is interested in the human, economic, and urban development of earth space.

The Master of Science degree is designed for the student with a strong mathematics and science background who is interested in the study of the physical factors in the total environment.

A student working for the Master's Degree in Geography shall complete a core program of 10 semester credits. The candidate shall demonstrate competence in the core program outlined below. The competence shall involve a knowledge of content at the level of sound undergraduate courses and the maturity of judgement and interpretation appropriate to a serious professional student at the graduate level.

In addition to the core program, the student and his adviser will select a sequence of courses of at least 10 semester credits in geography designed to meet the student's needs or interest. Courses to strengthen the concentration may be taken outside the department with the consent of the adviser.

Further, each candidate must complete the research requirement as established by the Graduate Council. The candidate may meet this requirement either by a thesis or written research problem.

The student will complete thirty (30) semester hours in accordance with the following divisions:

I. Subject Matter Concentration	20-24 s.h.
A. Core (required)	10 s.h.
Geog 594 Field Techniques	2 s.h.
Geog 589 Cartography for Thesis Writing*	2 s.h.
Geog 591 Geographic Thought*	2 s.h.
Geog 592-593 Geographic Research I & II	4 s.h.
M.Ed. candidates may take Grad 515, Elements of Research, in lieu of Geog 593, with special permission.	
*If these have been taken at undergraduate level, Cartography will be replaced by Statistics and one additional course will be elected in the concentration in lieu of 591.	
B. Student Interest	10-14 s.h.
1. M.Ed. 10-14 s.h. of geography needed for teaching career and approved by adviser.	
2. M.A. 10-14 s.h. of related geography courses under one heading: Human, Economic, Urban/Regional Planning as approved by advisor.	
3. M.S. 10-14 s.h. of related physical geography or Geo-Science courses as approved by advisor.	
II. Related Studies	6-10 s.h.
Courses within or outside the department may be taken to strengthen the concentration. The consent of the adviser is required.	
1. M.Ed. take 6 s.h. of Education (2 s.h. from each of three categories below)	
a. Grad 516 Statistical Methods I or LRes 500 Seminar in Learning Resources	2 s.h.
b. Ed. 511, 512, or 513 Historical, Philosophical, or Social Foundations of Education	2 s.h.
c. Geog 551 Professional Problems in Geography Ed. or	
An Approved Psychology course	2 s.h.
2. M.A. take 6-10 s.h. of related Social Science or Geography	
3. M.S. take 6-10 s.h. of related Geo-Sciences or Geography	
III. Research (in addition to core program)	0-4 s.h.
Grad 550 Thesis	2-4 s.h.
or Project	0 s.h.

Course Descriptions

Geog 516 Historical Geography of Cities and City Planning 2-3 s.h.
(Prerequisite: 12 s.h. of Geography or appropriate Social Science)

This course is intended to give the student a basic understanding of the beginning of city planning and how it has developed under the influences of the fundamental physical relationships of social, economic, and geographic conditions to reflect the art and science of present city planning. This course will examine the process of city planning as practiced during the ancient, medieval, and renaissance periods, and will provide a review of early planning efforts in America, as well as the present influences in city planning. (Lenglet, Warren)

Geog 517 General City and Regional Planning 2-3 s.h.
(Prerequisite: Geography 516 or equivalent)

The place of planning in the structure of government and the duties and responsibilities of planning commissions will be reviewed as well as planning enabling legislation of counties, cities, boroughs and townships. The process of preparing the City and Regional Comprehensive Plan will be studied. This course will examine the four

phases involved in the preparation of a community plan. Study items such as land use, natural resources, topography, soils, geology, climate, and drainage will be utilized to prepare a general comprehensive plan. (Lenglet, Warren)

Geog 518 Urban Design I

2-3 s.h.

(Prerequisite: Geography 517 or equivalent)

This course will offer the student an opportunity to work on the various concepts of city and subdivision design which will utilize and describe the effects of topography, natural resources and other physical elements as they affect urban design. Also included in this course will be a study of the neighborhood concept, planned unit development, and planning of new towns. (Lenglet, Warren)

Geog 519 Urban Planning Basic Studies and Analysis

2-3 s.h.

(Prerequisite: Geography 517 or equivalent)

Research, analytical design and plan-making techniques in urban and regional planning including studies of natural resources, land use, circulation, community facilities, public utilities, economic base, employment, population, market analyses, source and use of statistical data. This course will examine the basic study items necessary upon which to prepare urban and regional comprehensive plans. (Lenglet, Warren)

Geog 520 Physical Geography

2 s.h.

A study of the development, classification, distribution and interpretation of landforms, climates, soils, natural vegetation, underground resources, and water resources. The interrelationships among the elements of the physical environment will be stressed as a foundation to the understanding of man's role in geographic analysis. Earth-sun relationships and map projections are included. (Payne)

Geog 521 Advanced Human Geography

2 s.h.

The course is designed as a refresher course in geography for the non-geography major. Both systematic and regional studies will be made to acquaint the student with modern geography methods and techniques. (Gault, Ballas)

Geog 522 Aerospace Science

2-3 s.h.

This workshop will be conducted as a seminar with a number of visiting aerospace authorities. Topics included are: atmosphere and space environment; history of flight and flight problems; satellites and space probes; manned orbital and space exploration projects; propulsion, communication, and other systems. Problems of teaching and bibliography at the various elementary and secondary levels will be considered. An indoctrination flight in a small craft and field trips to air age installations and projects fortify learning. (Winslow)

Geog 523 Urban Geography

2-3 s.h.

An analysis is made of city types, patterns and functions as influenced by geographic conditions and other factors. City planning techniques and field study are utilized. (Winslow)

Geog 524 Cultural Geography

2 s.h.

This course will provide a study of the literature and methods of cultural geography. Topics to be studied include population, settlements, human ecology, culture areas, and related features. Individual study, analysis and reports will be stressed in addition to lecture. (Ballas)

Geog 525-540 Geography Regional Seminars

ea. 2-3 s.h.

Seminars are designed to let the student develop to his greatest potential. Each region is examined in detail for soil, topography, climate, vegetation, population, and the interrelationships evolved. Great stress is placed on individual study and class discussion rather than lectures.

Geog 525 Africa, South of Sahara (Ballas)
Geog 526 India, Pakistan and Indo-Chinese Peninsula (Weber, Kul-karni)
Geog 527 Mexico, Middle American and West Indian Islands (Winslow)
Geog 528 South America
Geog 530 U.S.S.R. (Zacur)
Geog 531 Northwestern Europe (Miller)
Geog 532 Mediterranean World (Weber)
Geog 534 China, Korea and Japan (Weber)
Geog 535 Australia and Pacific Islands (Anderzhon)
Geog 536 Polar Regions (Miller)
Geog 537 Eastern United States (Payne)
Geog 538 Western United States (Payne)
Geog 539 Canada (Gault)
Geog 540 Geography of Pennsylvania (Zacur)

Geog 541 Agricultural Geography 2-3 s.h.

World Agriculture patterns are the core of this course. Specific problems will be studied in view of both the countries involved and world environment. Stress will be placed upon individual study and research as well as classroom lecture. (Gault)

Geog 542 Industrial Geography 2-3 s.h.

Resources useful in the manufacturing process will be studied both as to their location and their place in the international exchange patterns of the world. Individual problems will be the core of the course placing great emphasis on research and reading. (Winslow)

Geog 550A, B, C Geographic Readings in Geography 2-6 s.h.

Geographic readings may be taken either as individual study or in group study. Readings may be either to gain breadth of geographic knowledge or depth in a particular segment of geography. (Staff)

Geog 551 Professional Problems in Geographic Education 2-3 s.h.

Classroom problems and discussion centered about "New Viewpoints in Geography" constitute the core of this course: Individual reports, group discussion and research will constitute the principal methods of presentation. (Anderzhon)

Geog 552 Seminar in World Resources 2-3 s.h.

World resources exploitation and utilization of the agricultural, mineral, forestry, and fishery industries are treated. Problems such as energy utilization, food distribution, population growth, regional planning, factory location, conservation measures, and foreign trade are considered. (Weber)

Geog 553 Political Geography 2-3 s.h.

Geographic factors and conditions are analyzed as they are related to the character and function of states. Political institutions are evaluated in light of modern and historic geographic conditions. Emphasis is given to the great world powers and geopolitical thought. (Miller)

Geog 560 Urban Planning Seminar 2-3 s.h.

(Prerequisite: Geography 517 or equivalent)

This course will deal primarily with the various plans and planning proposals necessary to prepare an urban or regional plan. This will include Future Land Use Plan, Community Facilities and Public Utility Plans, and Traffic and Circulation. Consideration will also be given to modern theories of urban and regional planning, and the planning and design of new communities. (Lenglet, Warren)

Geog 561 Urban Plan Implementation 2-3 s.h.

(Prerequisite: Geography 517 or equivalent)

Legal tools of planning: zoning, subdivision regulations, capital improvements programs, housing codes, building codes, and methodology and application of administrative procedures. Urban renewal programs will also be considered for examination of the Federal and Local Urban Renewal Programs, site selection, program administration, and relationship to urban and regional comprehensive planning. (Lenglet, Warren)

Geog 573 Climatology I (Regional) 2-3 s.h.

Dynamic and physical aspects of climatology. Topics covered: heat and water budget; principles of climatic classification; Koppen, Thornthwaite, Federov, and other systems; paleoclimates; regional climates of the continents; microclimates; statistical and mathematical models; climate change in space and time.

Geog 588 Physiography (U.S.A.) 2-3 s.h.

This course presents a detailed study of the landforms and surface waters of the United States. The origin, classification, and structure of mountains, plains, hills, coast lines, rivers, lakes are discussed as well as the agents causing their birth and subsequent modification, agents such as glaciers, stream erosion, wind abrasion, tides and ocean waves. (Payne)

Geog 589 Cartography for Thesis Writing 2-3 s.h.

This course develops an ability to complete maps and diagrams for the illustration of place location, areal distribution, and statistical data in thesis or professional papers. Special maps, charts, and diagrams will be considered as required by the individual student. (Payne) (No prerequisite)

Geog 590 Maps and Photographic Interpretation 2-3 s.h.

Maps and aerial photographs enable the geographer to correctly grasp the spatial perspective of the landscape; they enable him to garner much geologic, economic, and land use, transportation, strategic information quickly without costly, lengthy field trips. The course is designed to develop skill in extracting the foregoing information and to synthesize these data into geographical relationships. (Payne)

Geog 591 Geographic Thought I 2-3 s.h.

The history of the discipline, great ideas of geography, leading professionals, and unresolved issues will be considered. Stress will be upon individual research. Lectures and seminar presentation will be dominant. (Weber)

Geog 592-593 Geographic Research I & II

Prerequisite: Geog 591 for Research I 2 s.h.

Geog 592 for Research II 2 s.h.

Research in the area of geographic knowledge embraces field and bibliographical studies as well as introduction to authoritative sources. It includes familiarization with geographical concepts, geographic techniques, laboratory and field procedures, and utilization of instruments and devices. (Staff)

Geog 594 Field Techniques in Geography (Staff) 2-3 s.h.

Field Techniques are discussed and evaluated. Field tools and techniques are used in the study of a specific area. Emphasis is upon skill and interpretation of areal patterns of geographic phenomena.

Geog 595 Regional Field Studies 2-3 s.h.

Students are taken into the field to observe and to analyze the geographical relationships which exist between various physical and cultural phenomena. Various regions of North America to be visited

are selected on the basis of landscape diversity. Study may emphasize either physical or cultural geography and the student should contact the Geography Department prior to the semester of enrollment as to the exact region to be studied and the costs involved. (Staff)

Geog 599 Supervised Internship Teaching Experience 0-2 s.h.

Supervised teaching experience at the graduate level with stress on new materials and innovative teaching techniques. Enrollment is open only to students who have completed at least eight semester hours of graduate work. Note: credit can not be used toward master's degree. (Anderzhon)

GEOSCIENCE

Robert L. Woodard, Acting Chairman

Walter H. Granata, Jr.
Frank W. Hall, II
Frederick R. Park

Paul A. Prince
Connie J. Sutton

The geoscience department embraces several areas of study related to the earth, its structure, and its environment; specifically astronomy, geology, meteorology, and oceanography. The department participates in the Consortium of Marine Science operated jointly with nine other Pennsylvania Institutions at Lewes, Delaware. Graduate courses offered by the Consortium have the same acceptance as those taken on campus. Courses taken under descriptions in the Indiana University of Pennsylvania catalogue, with tuition paid to Indiana, are treated as in-resident courses but those taken under other descriptions are subject to the same limitations of all transferred credits.

Master's level degree programs are being prepared for review. While these unique programs are being developed the department will continue to grant a Master of Education in Science degree as a program for earth and space science teachers. Each candidate's courses and research will be selected in accord with his professional objectives and may include courses from this or other departmental offerings as they apply to his situation.

While it is known to be desirable to advance in this field as an extension of one's undergraduate work, it is recognized that the present teaching situation in the Commonwealth is such that many students will be entering the field without such training. Candidates will therefore be considered who have a minimum of one year of study in each biology, chemistry, and physics. The programs for these people will then call for most of one's work in the geosciences.

SCIENCE

Curriculum for Master of Education Degree

Students working for this degree with a major in Science will complete the thirty (30) semester hours of work in accordance with the following divisions:

I. Subject Matter Concentration Area — fourteen to twenty-two (14-22) semester hours of work in subject matter content is to be selected from the various courses in the areas of Biology, Chemistry, Geoscience, and Physics at the discretion of the candidate's adviser.

Courses from the Geoscience Department which may be elected to fulfill this requirement are:

Astro	534	The Sun's Family	2 s.h.
Astro	536	The Sidereal Universe	2 s.h.
Astro	540	Operation of the Planetarium	2 s.h.
Geol	503	Earth Processes	2 s.h.
Geol	504	Earth History	2 s.h.
Geol	505	Earth Materials	2 s.h.
Geol	506	Earth Deformation	2 s.h.
Geol	507	Life of the Geologic Past	2 s.h.
Geol	508	Glacial Geology	2 s.h.
Geol	514	Crystallography	2 s.h.
Geol	515	Mineralogy	2 s.h.
Geol	516	Petrology	2 s.h.
Geol	534	Geomorphology	2 s.h.

Geol	570	Invertebrate Paleontology	2 s.h.
Geos	570	Oceanography I	2 s.h.
Geos	571	Oceanography II	2 s.h.
Geos	572	Meteorology	2 s.h.
Geos	581	Problems in Geoscience	1-2 s.h.
Geos	591	Field and Laboratory Investigation in Geoscience	1-4 s.h.

II. Professional Studies — four to ten (4-10) semester hours of work, including Research Paper or the Thesis, to be selected from the following:

Grad	516	Statistical Methods I	2 s.h.
Grad	550	Thesis	2-4 s.h.
LRes	500	Seminar in Learning Resources	2 s.h.
Psy	531	Psychology of the Exceptional Child	2 s.h.
Psy	532	Studies in Pupil Adjustment	2 s.h.

III. Foundations of Education — two (2) semester hours of work to be selected from the following courses:

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

IV. Research Techniques — the following course is required. It should be scheduled early in the student's program:

Grad	515	Elements of Research	2 s.h.
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In certain courses in the science department, additional laboratory time may be required beyond the regularly scheduled periods. Students who select a four-credit sequence are required to complete the sequence.

COURSE DESCRIPTIONS

Astro 534 The Sun's Family 2 s.h.

This course is planned as a study of the characteristics and behavior of the planets and their satellites, asteroids, meteors, comets, and other phenomena of the solar system. One of the major topics will be to investigate and criticize several of the theories of its origin. It will require some treatment of celestial mechanics but will not require a background of calculus.

Astro 536 The Sidereal Universe 2 s.h.

A study of the characteristics and classification of the stars, their assemblage in groups and galaxies and their evolution. Techniques of gathering data are examined to gain an understanding of the role of the telescope, spectroscope and photometer in astronomical research. Laboratory exercises and night observations are a part of the course. Credit will be given only to those for whom the course represents an area of study for which credit has not previously been recorded.

Astro 540 Operation of the Planetarium 1 or 2 s.h.

A course designed to give directed study in the use and operation of the Spitz planetarium. The student will learn to: (1) select and present topics of astronomy for various educational levels through the medium of the planetarium, (2) make planetary setting adjustments of the instruments, (3) perform minor maintenance of the instrument, and (4) coordinate all aspects of program and instrument capability in the presentation of classroom instruction and public planetarium shows. Either an instructional program or a show for a public group will demonstrate accomplishment of the above objectives.

Prerequisites: Minimum of one previous year of study in astronomy including both the Solar Family and Sidereal Universe or ability to demonstrate a comparable proficiency by examination.

Geol 503 Earth Processes	2 s.h.
A study of the processes operating on the crust of the earth in the present and in the geologic past. Emphasis will be upon formation, alteration, transportation, and distortion of the materials making up the known portion of the earth.	
Geol 504 Earth History	2 s.h.
Earth History is designed to present to the student an understanding both of the underlying principles used in deciphering earth history as well as the geologic development of North America through geologic time.	
Geol 505 Earth Materials	2 s.h.
A study of the concentration of elements which make up the earth, the formation of stable compounds called minerals from the available elements and the aggregation of minerals to form rocks.	
Geol 506 Earth Deformation	2 s.h.
Study of the deformation structures of the earth's crust and the principles and processes involved in their genesis.	
Geol 507 Life of the Geologic Past	2 s.h.
This course is designed to acquaint students with the basic morphologic features of both invertebrate and vertebrate fossils and an understanding of their relative abundance and importance in the geologic past.	
Geol 508 Glacial Geology	2 s.h.
A study of the phenomenon of glaciation, including the study of glacial movement, glacial deposits, and an investigation of possible causes of glaciation. A working acquaintance with glacial land forms is provided by means of field trips to the glaciated region of N. W. Pennsylvania.	
Geol 514 Crystallography	2 s.h.
This course is designed for the geologist, chemist, and physicist. Minerals are studied utilizing common field and X-ray notation. External and internal morphology is examined. Stereographic projection techniques are applied.	
Prerequisites: Fundamentals of Mathematics, plus Mineralogy or Physical Chemistry, or permission of instructor.	
Geol 515 Mineralogy	2 s.h.
This course is a workshop in the study of and identification of minerals, the theory of mineral formation and structure, and mineral relationships. Simple chemical and physical techniques will be used for mineral identification.	
Prerequisite: Physical Geology or General Chemistry.	
Geol 516 Petrology	2 s.h.
This course is a study of rock phyla and their chemical and spatial relationships in the earth. Special attention is given to the genesis, mineral composition, and classification of the rock types. The ecology of igneous, sedimentary, and metamorphic rocks is studied in detail.	
Prerequisite: Mineralogy.	
Geol 534 Geomorphology	2 s.h.
A study of landforms and the processes and principles that govern both their origin and their subsequent development.	
Prerequisite: Structural Geology.	
Geol 570 Invertebrate Paleontology	2 s.h.
A morphological study of the major invertebrate life forms of the geologic past and their distribution in space and time.	
Prerequisite: Historical Geology or Zoology.	
Geos 570-571 Oceanography I and II	2-4 s.h.
An introduction to the physical, chemical, biological and geological nature of the ocean. Physical properties, distribution of variables, mass and energy budgets. Water masses and their circulation. T-S	

diagrams. Dynamical aspects of waves, tides, and currents. Common instruments in use. Elementary discussion of primary production, basic chemical reactions, and the primary geological features of the sea floor. Oceanography I is a prerequisite to Oceanography II. Both courses require a five day field trip to the **Pennsylvania Consortium of Marine Science** field station at Lewes, Delaware. Lectures, readings, term paper, laboratory and field trip. Permission of instructor required for course registration.

Geos 572 Meteorology**2-3 s.h.**

Basic and advanced considerations of the physical processes of the atmosphere. Basic parameters. Common instruments in use. Composition and structure of the atmosphere. Heat budget. Radiation laws, stability characteristics, isentropic analysis, cloud and rain physics. Circulation patterns, storm structures and atmospheric electricity. Lectures, readings, term paper, laboratory. Permission of instructor required for course registration.

Geos 581 Problems in Geoscience**1-2 s.h.**

A course designed to provide the student with an opportunity to study an area of astronomy, geology, meteorology, or oceanography not available in regular course offerings. The topic of study will be selected in consultation with one's major adviser to enhance the student's avowed program.

Geos 591 Field & Laboratory Investigations in Geoscience**1-4 s.h.**

A course listing to provide the opportunity for doing laboratory or field research in an assigned area of astronomy, geology, meteorology or oceanography. The problem will be defined and evaluated in consultation with the student's major adviser and the professor guiding the particular study. A maximum of four credits may be earned in the master's program and might be taken in segments or as one larger study. A written report summarizing the background information, research activity, and results will terminate each course requirement.

HEALTH-PHYSICAL EDUCATION

John Miller, Chairman

John Chellman, Dean, School of Health Services
Lawrence Tucker

HPe 521 Advanced Seminar in Health and Safety

2 s.h.

This course provides the student with current health and safety information and defines its relation to the needs of the school child, the home, the community, and the school. It emphasizes the application of health and safety instruction to the modern principles of education, and provides the student with concrete materials to help plan and implement an effective health and safety instructional program. The course is geared toward the particular health and safety problems that relate to the students in the class. (Tucker, Miller)

HPe 530 Workshop in Community School Health Education

2 s.h.

This workshop is concerned with school, community and public health as they relate to the interests of the workshop participants. Areas studied include mental health, nutrition, dental health, physical education, health services, environmental health, changing health patterns and health statistics. Teaching methods, special projects, consultations, visitations, discussions and sources of information and materials will be considered.

Credit for this workshop may be used in the general studies area of the elementary curriculum and, subject to the approval of the department chairman or program advisor, as an elective in all other programs. (Chellman, Tucker)

HISTORY

Clyde C. Gelbach, Chairman

Charles Cashdollar
 Steven Cord
 Ronald Ferguson
 Ernest B. Fricke
 Thomas D. Goodrich
 John F. Kadlubowski
 Dale E. Landon
 Neil B. Lehman
 Irwin Marcus
 Joseph Mastro

Jane S. Mervine
 Edgar Moore
 Robert L. Morris
 James M. Oliver
 J. Merle Rife
 John R. Sahli
 W. Wayne Smith
 Dorothy C. Vogel
 Albert J. Wahl
 George T. Wiley

The Master of Arts Degree in History is designed to give students both breadth and depth in that academic discipline. As a terminal degree it prepares teachers for the secondary schools and community colleges. The M.A. in History may also be used as preparation for advanced work leading to the Doctor of Philosophy degree in History.

Each student admitted to the Graduate School will be assigned to an adviser in the History Department. All courses must be approved by this adviser.

It is imperative that graduate students schedule SS 510, Research Methodologies in the Social Sciences, early in their graduate program. This course must be completed before seminar work may be scheduled.

Students working toward the Master of Arts degree in History will complete a minimum of thirty (30) semester hours of work in accordance with the following divisions:

I. Subject Matter Concentration (14-22 s.h.)

Hist 501	Historiography (Required)	2 s.h.
Hist 511	Readings in History	2 s.h.
Hist 512	Readings in History	2 s.h.
Hist 531	Economic and Social History of Pennsylvania	2 s.h.
Hist 532	U.S.-British Commonwealth Relations	2 s.h.
Hist 534	Recent U. S. History	2 s.h.
Hist 541	Modern European Problems	2 s.h.
Hist 542	Contemporary Latin American Problems	2 s.h.
Hist 543	Modern Asian-African Problems	2 s.h.
Hist 546	History of Europe, 1815-1914	2-3 s.h.
Hist 552	History of England to 1688	2-3 s.h.
Hist 553	History of England, 1688 to Present	2-3 s.h.
Hist 554	History of Russia to 1917	2-3 s.h.
Hist 555	History of Soviet Russia	2-3 s.h.
Hist 590	Social and Intellectual History of the United States to 1875	2-3 s.h.
Hist 591	Social and Intellectual History of the United States Since 1875	2-3 s.h.

II. Related Fields (0-8 s.h.)

Up to 8 s.h. in related fields may be elected by the student with the prior approval of his advisor or departmental chairman.

III. Research (8 s.h.)

The normal research requirement will involve SS 514, Research Methodologies in Social Science, and three history Seminars. Students who demonstrate special ability in a history seminar may, with the recommendation of the instructor, write a thesis carrying 2-4 additional semester hours credit to complete the research requirement. Students attending the University on a full-time basis may request substitution of a course for one of the three seminars.

SS	514	Research Methodologies in Social Science (Required)	2 s.h.
Hist	544	History Seminar (Prerequisite)	2 s.h.
Hist	521	History Seminar (Prerequisite)	2 s.h.
Hist	522	History Seminar (Prerequisite)	2 s.h.
Grad	550	Thesis	2-4 s.h.

Course Descriptions

Hist 501 Historiography 2 s.h.
An introduction to the various schools of historical writing with some consideration of the leading practitioners. Required of all history M.A. candidates. (Staff)

Hist 511 Readings in History 2 s.h.
Directed reading of significant historical materials, focused on a general topic. (Staff)

Hist 512 Readings in History 2 s.h.
Directed reading of significant historical materials, focused on a general topic. (Staff)

Hist 521 History Seminar 2 s.h.
Area research in the discipline, culminating in a formal paper. Prerequisite: SS 514.

Hist 522 History Seminar 2 s.h.
Area research in the discipline, culminating in a formal paper. Prerequisite: SS 514.

Hist 531 Economic and Social History of Pennsylvania 2 s.h.
This course analyzes the economic and social background of Pennsylvania with emphasis on regional development. The interplay of such factors as industrialization and immigration on organizational movements will be studied through the problem approach. (Sahli)

Hist 532 U.S.-British Commonwealth Relations 2 s.h.
Emphasis is placed on those aspects of United States and Commonwealth backgrounds and policies that aid mutual understanding and international accord in the modern world. (Gelbach)

Hist 534 Recent U. S. History 2 s.h.
A course devoted to an analysis of the fundamental changes in American culture since 1929. (Cord)

Hist 541 Modern European Problems 2 s.h.
A course area that considers Europe from the economic, social, political, diplomatic, and cultural points of view. Attention is also given to specific problems and to the role of European powers in world affairs. (Rife, Oliver)

Hist 542 Contemporary Latin American Problems 2 s.h.
A study of the major cultural, economic, political, and related problems currently confronting the Latin American countries. (Moore)

Hist 543 Modern Asian-African Problems 2 s.h.
To understand better the nature and problems of a large portion of the non-Western world, the emphasis will be placed upon an analysis of contemporary, social, economic, and political developments in selected areas of Asia and Africa. (Goodrich)

Hist 544 History Seminar 2 s.h.
Area research in the discipline, considering various facets of a central problem. Prerequisite: Research Methodologies in Social Science. (Staff)

Hist 546 History of Europe: 1815-1914**2-3 s.h.**

A comprehensive study of the factors contributed by the European people in their national organization through their political, social, and economic activities. The understanding of these casual and intergroup relationships are basic to analysis and interpretations of the European world today. May not be programmed by students with undergraduate credit for History of Nineteenth Century Europe. (Oliver, Rife)

Hist 552 History of England to 1688**2-3 s.h.**

A survey of the growth of the English nation with emphasis on the political, social, and economic developments leading to the 17th century conflict between Crown and Parliament. (Wiley)

Hist 553 History of England, 1688 to Present**2-3 s.h.**

A survey of the growth of England as a democratic constitutional monarchy. Attention is directed to the industrial revolution, and to imperial expansion, and to England's role in the 20th century world. (Wiley, Landon, Gelbach)

Hist 554 History of Russia to 1917**2-3 s.h.**

A general survey of Russian history, culture, and institutions. Special consideration is given to the study of those historical forces which were formative of the Revolution in 1917. (Kadlubowski)

Hist 555 History of Soviet Russia**2-3 s.h.**

A general survey of contemporary Soviet history, culture, and institutions. Special consideration is given to the study of communist theory and its place in current Russian historiography. (Kadlubowski)

Hist 590 Social and Intellectual History of the**United States to 1875****2-3 s.h.**

A study of the social and intellectual factors which helped to shape the nation up to the time of Henry George. (Cashdollar)

Hist 591 Social and Intellectual History of the**United States Since 1875****2-3 s.h.**

An analysis of the cultural forces which have helped to shape modern America. Ways of living characteristic of certain periods will be studied, together with the more significant social-reform movements and their attendant systems of thought. (Cashdollar)

HOME ECONOMICS EDUCATION

Kathleen Jones, Chairman

Margaret McGeever, Dean, School of Home Economics

Ruth Anderson

Patricia Bell

Louise Fernandez

Bernice W. King

Yu-Chen Liu

Satya Sharma

The Home Economics Education graduate program is designed to meet the needs of individuals who wish to pursue education beyond the bachelor's degree and to become better qualified for home economics education positions in the areas of teaching and supervision.

To qualify for admission into this curriculum leading to a Master of Education degree a student must have completed a baccalaureate degree in home economics with a major in home economics education or with a minimum of 36 semester hours of home economics, 18 semester hours education, including home economics education and student teaching, and a minimum of 3 semester hours in educational psychology. The degree must be from an approved institution.

Each student admitted to the Graduate School will be assigned a faculty adviser by the Chairman of the Department. This adviser will help the student plan his program of study in terms of his individual needs and professional goals. Courses should be planned to meet the degree requirement and should have the approval of the adviser. Any deviation from the degree requirement shall have the written approval of the adviser and the Department Chairman.

A thesis or a research project is required. The selection of and the proposal for the research shall be approved by the adviser and other members of the student's Graduate Committee. The research shall be carried on by the student under the direction of the research adviser and committee members.

Grad 515 should be scheduled early in the student's program. HE 578 should be scheduled soon after taking Grad 515 and preferably after two or more courses in Home Economics Education are completed.

CURRICULUM FOR THE MASTER OF EDUCATION DEGREE

Students working for this degree will complete thirty (30) or more semester hours of work. Courses should be selected in accordance with the following divisions:

I. General Studies—two (2) or more semester hours of work to be selected from the courses listed below or from others approved by his adviser:

Art	521	Contemporary Movements in Art	2	s.h.
Art	522	Art in America	2	s.h.
Art	543	Exhibition Techniques	2	s.h.
Art	544	Graduate Studio in Fabrics I	2	s.h.
Art	545	Graduate Studio in Fabrics II	2	s.h.
Art	546	Graduate Studio in Fabrics III	2	s.h.
Bus	570	Economic Background of Business	2	s.h.
Eng	512	American English Grammar	2	s.h.
Eng	531A	Major Writers: Emerson, Hawthorne and Thoreau	2	s.h.
Eng	534	Types of Novel	2	s.h.
Eng	537	Modern American Fiction	2	s.h.
Eng	540	Twentieth Century American Drama	2	s.h.
Eng	557	Modern American Poetry	2	s.h.

Math	521	Basic Concepts in Mathematics	2 s.h.
Mus	521	Music Literature and Materials	2 s.h.
Phil	581	Problems in Logic	2 s.h.
Phil	582	Problems in Ethics	2 s.h.
Phil	583	American Philosophic Thought	2 s.h.
SS	521	Contemporary American Issues	2 s.h.
SS	561	Social Policy Studies	2 s.h.
Soc	565	Adolescent in American Society	2 s.h.

II. Home Economics Subject Matter Areas—eight (8) or more semester hours from two or more phases of home economics to be selected from the following:

Clothing and Textiles

HE	530	Clothing and Human Behavior	2 s.h.
HE	531	Creative Clothing	2 s.h.
HE	532	Recent Developments in Textiles	2 s.h.
*HE	597	European Study Tour in Textiles and Clothing	2-6 s.h.

Foods and Nutrition

HE	540	Advanced Human Nutrition	2 s.h.
HE	541	Advanced Foods and Gourmet Cookery	2 s.h.
HE	542	Contemporary Issues in Foods and Nutrition	2 s.h.
*HE	598	Oriental Study Tour in Foods	2-6 s.h.
*HE	599	European Study Tour in Foods	2-6 s.h.

Home Management and Family Economics

HE	551	Seminar in Home Management and Family Economics	2 s.h.
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Housing

HE	560	Problems in Housing and Interior Design	2 s.h.
HE	561	Household Equipment and Appliances	2 s.h.

Human Development and the Family

HE	521	Problems in Family Living	2 s.h.
HE	522	Seminar in Human Development	2 s.h.
HE	523	Field Work in Family Life or Human Development	2 s.h.
*HE	596	Study Tour in Oriental Family Life	2-6 s.h.

*Two to four (2-4) hours of tour courses in one area may apply toward degree requirements.

III. Home Economics Education—ten (10) or more semester hours to be selected from the following or other approved courses:

**HE	570	Vocational Education—Home Economics In American Education	2 s.h.
**HE	571	Curriculum Development in Home Economics	2 s.h.
**HE	572	Evaluation in Home Economics	2 s.h.
HE	573	Supervision and Administration in Home Economics Education	2 s.h.
HE	574	Seminar in Home Economics Education	2 s.h.
HE	575	Home Economics in Higher Education	2 s.h.
HE	577	Independent Study in Home Economics Education	2 s.h.
**HE	578	Research in Home Economics Education	2 s.h.
Grad	550	Thesis	2-4 s.h.

**Required.

IV. Related Studies—two (2) or more semester hours to be chosen from the following or other approved courses:

Grad	516	Statistical Methods I	2 s.h.
Psy	530	Psychology of Growth and Development	2 s.h.
***Ed	540	Supervision and Student Teaching	2 s.h.
Psy	536	Psychology of Learning	2 s.h.
LRes	500	Seminar in Learning Resources	2 s.h.

***Four (4) s.h. are required in educational supervision and administration for certification to supervise the teaching of home economics.

V. Foundations of Education—two (2) semester hours to be selected from the following:

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

VI. Research—The following course is required. It should be scheduled early in the student's program.

Grad	515	Elements of Research	2 s.h.
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HOME ECONOMICS COURSES

Clothing and Textiles

HE 530 Clothing and Human Behavior 2 s.h.
 Emphasis is placed upon understanding factors affecting clothing decisions of differing individuals and families. Cultural, social, psychological and economic influences are considered. Concepts from anthropology, sociology, psychology and economics are explored in studying the relation of clothing to human behavior.

HE 531 Creative Clothing 2 s.h.
 Factors that influence clothing design and sources of design inspiration are investigated. Lines, shapes, colors and textures are studied in relation to the creation of clothing to fit the human body. The effects of fabric finishes, drapability, and dimensional stability on design are explored. The principles and procedures studied are applied in two major projects: students create a half-scale model and a full-sized garment.

HE 532 Recent Developments in Textiles 2 s.h.
 This course is designed to acquaint the student with new developments in textiles as they affect the consumer and to provide further study of textiles for the recent undergraduate. Emphasis is placed upon understanding factors involved in the selection, use, and care of new fibers, fabrics, and finishes.

HE 597 European Study Tour in Clothing and Textiles 2-6 s.h.

This tour provides the opportunity to visit European establishments concerned with the production of textiles and apparel and to view historic costumes and textiles, including some of the world-famous tapestries. Fashion houses, designer salons, textile mills, apparel industries, cottage industry centers, retail stores, and museums are visited. Both traditional and modern methods of clothing and textile production are observed.

Foods and Nutrition

HE 540 Applied Human Nutrition 2 s.h.
 Nutritional needs and problems occurring at different stages in the life cycle are studied: pregnancy, infancy, early childhood, adolescence, aging.

HE 541 Advanced Foods—Gourmet Cookery 2 s.h.
The course is an investigation, analysis, and interpretation of the art and science of cooking as influenced by historical, racial, religious and social customs. Both foreign and domestic gourmet cookery are studied. Foods characteristic of many different countries are discussed. Laboratory experiences are a part of the course.

HE 542 Contemporary Issues in Foods and Nutrition 2 s.h.
Contemporary issues in foods and nutrition are reviewed and analyzed. Current information is evaluated for its reliability.

HE 598 Oriental Study Tour in Foods 2-6 s.h.
A comprehensive program of directed activities provides opportunity for students to gain first-hand knowledge of the growing, processing and preparation of oriental foods. Significant phases of the history and culture of the people of oriental lands as related to food are studied. Students visit rural and city homes and participate in the preparation of foods.

HE 599 European Study Tour in Foods 2-6 s.h.
European foods are studied in relation to cultural, economic, and religious influences. The tour provides the opportunity to see food markets, processing plants, food stores, catering schools, research centers, and chef's training schools. Lectures and demonstrations are given by food experts. Famous restaurants where typical European food is served are visited.

Home Management and Family Economics

HE 551 Seminar in Home Management and Family Economics 2 s.h.

The newer concepts and developments in the areas of home management and family economics are studied. Recent research in these fields is reviewed. Emphasis is placed upon understanding the principles of the management process; planning, organizing and controlling as applied to the activities of the home. Other topics discussed are: the socioeconomic environments of the family, family wants and resources, decision-making concerning the utilization of available goods and services, and the means for improving family consumption patterns.

Housing and Interior Design

HE 560 Problems in Housing and Interior Design 2 s.h.

The influences which contribute to the design of the modern home and its furnishings are investigated. Housing needs are studied in relation to stages in the family-life cycle.

HE 561 Household Equipment and Appliances 2 s.h.

Modern appliances and household equipment are studied in terms of materials used, methods of construction, and principles of operation and care. Various products on the market are evaluated for their efficiency and usefulness.

Human Development and The Family

HE 521 Problems in Family Living 2 s.h.

Emphasis is placed on solving problems created by social change. New knowledge from science, medicine, sociology, economics, art, and psychology is utilized to improve family living. Problems concerned with food, clothing, shelter, management, and family relationships are investigated. (Open to majors and non-majors.)

HE 522 Seminar in Human Development 2 s.h.

Pertinent literature dealing with aspects of human development is critically reviewed and analyzed. An intensive study of a selected topic or problem related to human development is required of each student. (Permission of instructor for non-majors.)

HE 523 Field Work in Family Life or in Human Development

2 s.h.

This course is designed to study individual personality and family interaction and methods of working with various types of families in the community through an analysis of research, scientific literature, and community programs. Advanced graduate students plan and participate in a laboratory-type experiment with individual families. (Permission of instructor for non-majors.)

HE 596 Study Tour in Oriental Family Life

2-6 s.h.

This tour offers the opportunity to observe the oriental family social structure and values in relation to the cultural background and economic conditions. Culture, class, and ethnic variations in the family and kinship systems are examined, emphasizing the relationships to international relations and family life education.

HE 570 Home Economics in American Education

2 s.h.

The present status of home economics is reviewed in terms of the history and philosophy of the profession. The role and contribution of home economics in relation to the total educational program at the elementary, secondary, post secondary, and higher education levels are discussed. Educational trends and issues which are critical to the future of home economics are investigated.

HE 571 Curriculum Development in Home Economics Education

2 s.h.

The various tasks and processes of curriculum development are reviewed and analyzed. The central problems of curriculum organization are studied: scope, sequence, continuity, and integration. Special attention will be given to making realistic curriculum decisions and using innovative procedures in developing the home economics curriculum.

HE 572 Evaluation in Home Economics

2 s.h.

This course involves a study of the nature and scope of evaluation in contemporary home economics programs in the secondary schools. It is planned to familiarize the student with a variety of evaluative methods and techniques designed to measure a comprehensive range of home economics educational objectives. Special attention is given to the use and construction of teacher-made tests and evaluative devices.

HE 573 Supervision and Administration in Home Economics Education

2 s.h.

This course deals with the principles, methods, and techniques of supervision in home economics education in the secondary schools. Special attention is given to basic concepts in supervision such as human relations, the communication process, decision-making, leadership strategies, and the role of action-research in improving school practices in home economics.

HE 574 Seminar in Home Economics Education

2 s.h.

Selected professional education problems are dealt with by the group and the individual. This course places emphasis on a critical evaluation and interpretation of current and classical research and studies related to selected professional problems in areas such as:

- A. Curriculum
- B. Teaching
- C. Learning
- D. Youth Organizations
- E. Evaluation
- F. Supervision

- G. Administration
- H. Philosophy
- I. Extended Employment and Home Experiences
- J. Contemporary Home Economics Learning Centers

Research methods and techniques used in solving problems are analyzed and evaluated. The student plans and conducts an intensive investigation and analysis of the major literature and research related to a selected topic or problem.

HE 575 Home Economics in Higher Education 2 s.h.

Contemporary programs of home economics at the college level are studied and evaluated in terms of major issues, trends, and problems in higher education and professional home economics. Problems of curriculum development, effective teaching, guidance, and evaluation are emphasized.

HE 577 Independent Study in Home Economics Education 2 s.h.

Students select one or more current problems or significant topics in home economics education for investigation and meet with assigned staff member for guidance and supervision. Independent reading, study, analysis, and evaluation are emphasized. Where appropriate, special attention will be given to the use of research methods and experimentation in problem solving. (Registration only by permission of Department Chairman.) Prerequisite HE 570 and 571.

HE 578 Research in Home Economics Education 2 s.h.

Reports by home economics, behavioral science, and education researchers are analyzed and evaluated. Methodology introduced in Grad 515 is studied further in terms of home economics research problems. This course is designed to assist the student in defining his own research problem or thesis. This course shall not be scheduled before Grad 515. Prerequisite HE 570, 571, or 572.

LEARNING RESOURCES AND MASS MEDIA

Curriculum for Certification as a Learning Resources Specialist

Norman W. Sargent, Chairman

Lawrence D. Bergman
Edward Hauck
Merle G. Klinginsmith
Donald M. MacIsaac

Richard H. Madden
Daniel V. Mattox, Jr.
William E. McCavitt
J. Robert Murray

The graduate program in Learning Resources and Mass Media is designed primarily to offer the student certification as a Learning Resources Specialist. Certificates will be granted to students who complete the following requirements:

1. Hold a permanent college certificate valid for elementary or secondary education.
2. Complete 24 semester hours of graduate work in the curriculum of Learning Resources and Mass Media and related subjects as outlined in the curriculum for certification as a Learning Resources Specialist.

Any student seeking permanent college certification and/or working toward a Master's degree within the graduate school may, with the approval of his adviser, his department chairman, and the chairman of the Department of Learning Resources and Mass Media, elect up to ten semester hours from the Learning Resources curriculum. These credits may then be applied toward certification as a Learning Resources Specialist. Students not in the educational profession (i.e., business or industry) and who otherwise meet the admission requirements for graduate school may pursue the program for Learning Resources Specialist and upon completion of the requirements may be granted a special Certificate of Proficiency by the University.

A student who presents proof of competency in one or more of the basic courses in the curriculum may, with the approval of his adviser, and the department chairman, elect another course from the Learning Resources curriculum or from some other curriculum in the University. Up to six of the 24 hours required for certification must be taken as an internship program as approved by the University.

For the student to become competent for this certification, he, in conjunction with his adviser, the department chairman, and the Dean of the Graduate School, will select a balance of courses from the following areas:

1. Learning theory relative to learning resources and communications (LRes 500-515)
2. Fundamentals of library science (LRes 530)
3. Production and utilization of learning resources (LRes 540-551)
4. Organization and operation of learning resources centers (LRes 560-569)

LRes 500 Seminar in Learning Resources 2 s.h.
An introductory course to the area of Learning Resources. Major emphasis will be placed upon the differences among learning materials, learners and teaching methods. The student will have the opportunity to do literary research for a better understanding of how Learning Resources are related to the learning process in our modern society. (Murray, Sargent) (Students who have taken Ed 518, Seminar in Sensory and Audio-Visual Materials, should not schedule this course.)

LRes 501 The Classroom Use of Motion Pictures 2 s.h.
Develops a basis for the critical evaluation of films for various educational purposes. Emphasis will be placed upon an understanding of production techniques, stereotypes, prejudices, and misconceptions which influence the quality of educational films, and upon the methods of selection, acquisition, evaluation and distribution of films. (MacIsaac)

LRes 502 Programmed Learning in Education 2 s.h.
Will cover historical development, theory and philosophy, auto instructional equipment, programmed texts, theories of programming, types of programs available, analysis and evaluation of research. (Sargent)

LRes 503 Writing for A-V Production 2 s.h.
Provides an introduction to script writing for films and filmstrips. Various styles and techniques of writing will be analyzed and each student will be expected to experiment with the techniques presented. Emphasis will be placed on writing and upon criticism, in class, of student scripts. (McCavitt)

LRes 504 Foundations of Broadcasting 2 s.h.
An examination of the historical, legal, and economic aspects of modern broadcasting. Extensive readings in fundamental theory and a study of current station and network practices, educational as well as commercial. (McCavitt)

LRes 505 Role of Learning Resources in Broadcasting 2 s.h.
A study of the effective use of learning resources for the most beneficial learning situations in radio and television broadcasting. Will give the student the opportunity to concentrate on the theory of communication, psychology of audience variability, picture primary, protagonist prestige, level of verbalization, etc. (McCavitt)

LRes 506 Evaluation of Research in Educational Effectiveness of Mass Media 2 s.h.
Will offer the opportunity to examine and evaluate the research and research findings of significant studies and summaries of studies in areas of mass media. Only the educational implications of the studies will be considered. Students may have the opportunity to concentrate upon one area of interest, as motion pictures, television, radio, journalism, etc. (Staff)

LRes 507 Seminar of Current Problems in Broadcasting 2 s.h.
An examination of current developments in the field. The national press and trade publications are used as texts and some experience is given in locating the sources of much needed and frequently used television information. (McCavitt)

LRes 508 Advanced Techniques in Utilization of Learning Laboratories 2 s.h.
Will investigate the use of language labs in all areas of the curriculum, the use of dial access retrieval systems, computer based instruction, and other self-instructional techniques. (Staff)

LRes 509 Programming of Multi-Media Materials 2 s.h.
Will investigate practical ways of combining a variety of media into an effective teaching-learning situation. (Sargent)

LRes 515 Role of Learning Resources—Theoretical and Research Foundations 2 s.h.
Examines the role of perception as pertains to sensory experiences and inner cognitive processes in relationship to maturation, goals and drives, and environment. Seeks to relate psychological processes to learning resources, with emphasis on the newer media. (Staff)

LRes 530 Classification and Cataloging of Learning Resources 2 s.h.
Principles of classifying and cataloging learning resources, such as motion pictures, video tapes, filmstrips, slides, transparencies, disk and tape recordings, microfilm, microcard and microfiche, flat pictures, etc. For learning resources administrators and librarians. (Library staff)

LRes 540 Preparation of Learning Resources 2 s.h.
Introductory course to the preparation of a wide variety of classroom materials, in which building coordinators, as well as others, can assist teachers—lettering, coloring, mounting, bulletin boards, feltboards, and the preparation of pictures, maps, posters, charts, and graphs for projected and non-projected use. (Staff)

LRes 541 Photographic Fundamentals for Educational Materials 2 s.h.

Emphasis will be placed on the use of the still picture camera and the darkroom for instructional purposes, the making of b/w negatives, 35mm slides, copywork, developing b/w and color film, and b/w contact printing and enlarging. Each student must furnish his own 35mm camera and an acceptable exposure meter. No previous photographic experience is necessary. (Staff)

LRes 542 Preparation of Transparencies 2 s.h.

Covers the various methods of producing transparencies larger than 35mm slides starting with the Polaroid system for $3\frac{1}{4} \times 4"$ slides as well as regular photography; the use of photocopying machines; addition of color using a variety of materials and techniques; methods of lettering; techniques in transferring printed materials to transparencies; and the latest techniques and materials available in this area of production. (Staff)

LRes 543 Slide and Filmstrip Production for Education 2 s.h.

Prerequisite: Photographic Fundamentals. This course emphasizes the techniques of color and b/w slide preparation, duplication, titling and binding; it will introduce the techniques necessary to produce color filmstrips on a commercial basis, and students will participate in the making of a filmstrip through all stages, from script to screen. Techniques for making home-made filmstrips will also be explored. Each student must furnish his own 35mm camera, and an acceptable exposure meter. (Staff)

LRes 544 Beginning Cinematography for Education 2 s.h.

Emphasis will be placed on the effective use of the motion picture camera and editing tools to make useful, locally produced teaching films. No previous experience is necessary, but the student should own or have access to an 8mm or 16mm camera, and an acceptable exposure meter. (MacIsaac)

LRes 545 Advanced Motion Picture Production for Education 2 s.h.

Prerequisite: Beginning Motion Picture Production. This course will emphasize production planning for motion pictures, directing, advanced picture and sound editing techniques, and the use of sound recording and laboratory facilities. In addition to live action cinematography titling, animation, and special effects photography will be investigated. (MacIsaac)

LRes 546 Motion Picture Production Workshop 2 s.h.

Prerequisites: Beginning Cinematography, Advanced Cinematography, and Writing for A-V Production. Students will work as a team to shoot, edit, and sound a 16mm motion picture under the supervision of the instructor. Each student will have the opportunity to work variously as cameraman, assistant cameraman, director, assistant director, unit manager, sound recordist, script secretary, editor, mixer, etc. (Staff)

LRes 547 Animation**2 s.h.**

Introduces a variety of motion picture animation techniques, and offers practical experience in planning and carrying out the production of animated sequences. A wide variety of films will be viewed and discussed; experimentation in class and through projects with filmograph, cut-out animation, puppet animation, and full cell animation. Practice in designing, drawing, tracing, inking, and painting cells; preparation of blackboards, use of cell-boards, animation camera and animation stand; preparation of story boards and cue sheets; integration of visual and sound. (MacIsaac)

LRes 548 Writing for Radio and Television**2 s.h.**

For teachers, school administrators, and non-school persons interested in public service, non-professional, or educational broadcasting. Presents theory and practice in planning, writing, and producing various kinds of programs for listeners in and out of schools. Educational and/or radio experience is desirable but not required. (McCavitt)

LRes 549 Television Production and Direction**2 s.h.**

An intensive laboratory course using closed circuit facilities designed to develop skills in program production and direction. Theory and practice of production is examined with each student expected to produce a television program during the course. (McCavitt)

LRes 550 Advanced Audio Recording Techniques**2 s.h.**

Theory and practice of recording sound for motion pictures, video tapes, audio tapes, sound filmstrips, etc. Will use sound on sound and other special recording techniques. (Staff)

LRes 551 Advanced Techniques in Transparency Production**2 s.h.**

Will provide opportunities to design and produce complex multi-color transparencies and simulated motion through specialized techniques. (Staff)

LRes 560 Management of Learning Resources Program**2 s.h.**

Considers the problems in setting up and managing an integrated program, including production, selection, utilization, and management of Learning Resources Centers; problems of finance; function and organization of the different services; relationships among school systems, colleges, and community and adult groups; and evaluation standards for the various services. (Murray)

LRes 568 Research Methods and Theory in Learning Resources**2 s.h.**

Examines research techniques for application to investigations in the areas of learning resources administration, analysis of media content and audience characteristics, and effects of educational and commercial communications. Also will consider problems in writing proposals for federal research grants and for ESEA grants. (Staff)

LRes 569 Internship Program of Learning Resources Specialists**2-6 s.h.**

A program in which a candidate would work in a carefully planned variety of roles in a comprehensive regional learning resources center or similar situation, television broadcasting or closed-circuit facility, motion picture production agency, programmed learning development organization, learning resources workshop program, little theater group, major museum or approved equivalent, under competent university and agency supervision, and would be rated by both the cooperating agency and the University.

MATHEMATICS

Melvin R. Woodard, Chairman

Joseph S. Angelo	Joseph J. Hradnansky	Maher U. Shawer
Ida Z. Arms	Charles Maderer	Jack L. Shepler
John F. Busovicki	James H. Maple	Harvey A. Simmons
John M. Camden	Doyle R. McBride	William R. Smith
Willard Conner	Ronald L. McBride	Elwood R. Speakman
Blaine Crooks	Ronald E. McCoy	Merle E. Stilwell
Donald D. Duncan	Wallace F. Morrell	LaVerne Thompson
Nancy Fincke	Carl P. Oakes	Marilyn E. Vallowe
Raymond D. Gibson	Joseph A. Peters	Halley O. Willison
Marlin E. Hartman	William Rettig	Richard E. Wolfe
John P. Hoyt	Dale M. Shafer	

The degrees offered by the Department of Mathematics are the Master of Education with a major in mathematics and the Master of Science with a major in mathematics.

Each student admitted to the Graduate School will be assigned an adviser in the Mathematics Department. All courses must be approved by the adviser. Each student must obtain a "Permit to Enter" slip from the adviser before enrolling in any mathematics course. This slip should be obtained prior to registration. These will be collected by the instructor during the first class period. Students from other departments enrolled in mathematics courses for mathematics majors may obtain "Permit to Enter" slips from the Chairman of the Mathematics Department.

It is recommended that graduate students begin their research early in their graduate program. As soon as the research course is completed, a student should request from the Chairman of the Mathematics Department that a research adviser be assigned. The adviser will likely be a different person than the course adviser.

Master of Education Degree

Students working for this degree with a major in Mathematics will complete a minimum of thirty (30) semester hours of work in accordance with the following divisions:

I. Subject Matter Concentration Area—fourteen to twenty-two (14-22) semester hours of work in subject matter content are to be selected from the following courses in which the student must take at least one two-semester sequence from each of "Analysis" (other than Math 529-530) and "Algebra"; and at least one course from each of the headings, "Geometry" and "Additional Courses."

ANALYSIS

Math 529	Differential Equations	2 s.h.
Math 530	Partial Differential Equations	2 s.h.
Math 531	Advanced Calculus I	2 s.h.
Math 532	Advanced Calculus II	2 s.h.
Math 533	Functions of a Complex Variable I	2 s.h.
Math 534	Functions of a Complex Variable II	2 s.h.
Math 535	Functions of a Real Variable I	2 s.h.
Math 536	Functions of a Real Variable II	2 s.h.
Math 539	Infinite Series I	2 s.h.
Math 540	Infinite Series II	2 s.h.
Math 543	Vector Analysis I	2 s.h.
Math 544	Vector Analysis II	2 s.h.

ALGEBRA

Math 552	Number Theory	2 s.h.
Math 561	Abstract Algebra I	2 s.h.
Math 562	Abstract Algebra II	2 s.h.

Math	563	Linear Algebra I	2 s.h.
Math	564	Linear Algebra II	2 s.h.
Math	565	Theory of Groups	2 s.h.

GEOMETRY

Math	571	Modern Geometry I	2 s.h.
Math	572	Modern Geometry II	2 s.h.
Math	575	Projective Geometry I	2 s.h.
Math	576	Projective Geometry II	2 s.h.

ADDITIONAL COURSES

Math	570	Point Set Theory	2 s.h.
Math	573	Topology I	2 s.h.
Math	574	Topology II	2 s.h.
Math	580	Logic	2 s.h.
Math	582	Theory of Probability	2 s.h.
Math	584	Mathematical Statistics I	2 s.h.
Math	585	Mathematical Statistics II	2 s.h.

II. Professional Studies—four to ten (4-10) semester hours of work, including Research Paper or the Thesis, to be selected from the following:

LRes	500	Seminar in Learning Resources	2 s.h.
Grad	517	Statistical Methods in Ed. II (with approval of adviser)	2 s.h.
Grad	550	Thesis	2-4 s.h.
Psy	531	Psychology of the Exceptional Child	2 s.h.
Psy	532	Studies in Pupil Adjustment	2 s.h.
Math	510	Seminar in Mathematics I (Jr. H. S. Mathematics)	2 s.h.
Math	511	Seminar in Mathematics II (Sr. H. S. Mathematics)	2 s.h.

III. Foundations of Education—two (2) semester hours of work to be selected from the following courses:

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

IV. Research Techniques—the following course is required. It should be scheduled early in the student's program:

Grad	515	Elements of Research	2 s.h.
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V. Elective Courses—Cannot count in minimum requirements of concentration area but may count toward degree.

Math	501	Digital Computer Programming (FORTRAN) ..	2 s.h.
Math	502	Digital Computers and Compiler Systems	2 s.h.
Math	503	Seminar: Computer Applications in Research ..	2 s.h.
Math	507	Numerical Analysis	2 s.h.

Master of Science

The major purpose of this degree is to provide the students with a rigorous course of training in graduate level mathematics (1) which can be used as preparation for advanced degrees, or (2) which can be used as basic preparation for specialization in applied mathematics, or (3) for a terminal degree in mathematics. An essential feature of this degree program is a mathematics research paper.

After the course Research Methods in Mathematics has been completed, each student should request a research adviser from the Chairman of the Mathematics Department. This adviser may be a different person than the course adviser.

Students working for this degree will complete thirty (30) credit hours of work in accordance with the following plan:

I. Subject Matter Concentration Area 18-26 s.h.
 Before being admitted to candidacy for the degree students must successfully complete 14 s.h. of work in mathematics courses as follows:

Math 531-532	4 s.h.	Advanced Calculus I and II
Math 533	2 s.h.	Functions of a Complex Variable I
Math 561-562	4 s.h.	Abstract Algebra I and II
Math 563-564	4 s.h.	Linear Algebra I and II

If some of these courses have been completed satisfactorily by a student in his undergraduate preparation, then a suitable higher level course in the same area should be substituted, as approved by the student's faculty adviser.

In addition to the above courses, students must complete at least two of the following courses. In the case of a level II course, it is to be understood that the level I course has already been successfully completed either at the undergraduate or graduate level. Credit for the level I course taken as a graduate course will be given toward the required number of s.h. for the degree, with the approval of the faculty adviser.

Math 530	2 s.h.	Partial Differential Equations
Math 534	2 s.h.	Functions of a Complex Variable II
Math 565	2 s.h.	Theory of Groups
Math 574	2 s.h.	Topology II
Math 576	2 s.h.	Projective Geometry II
Math 585	2 s.h.	Mathematical Statistics II

Following is a list of all courses offered by the Mathematics Department that will be accepted as credit toward the M.S. Degree. This includes all those previously mentioned, as well as noting additions and revisions in name or number of some existing courses.

Math 501, 502, 503		Computer Courses
Math 507	2 s.h.	Numerical Analysis
Math 529-530	4 s.h.	Differential Equations and Partial Differential Equations
Math 531-532	4 s.h.	Advanced Calculus I and II
Math 533-534	4 s.h.	Functions of a Complex Variable I and II
Math 535-536	4 s.h.	Functions of a Real Variable I and II
Math 539-540	4 s.h.	Infinite Series I and II
Math 543-544	4 s.h.	Vector Analysis I and II
Math 552	2 s.h.	Number Theory
Math 561-562	4 s.h.	Abstract Algebra I and II
Math 563-564	4 s.h.	Linear Algebra I and II
Math 565	2 s.h.	Theory of Groups
Math 573-574	2 s.h.	Topology I and II
Math 575-576	4 s.h.	Projective Geometry I and II
Math 580	2 s.h.	Logic
Math 582	2 s.h.	Theory of Probability
Math 584-585	4 s.h.	Mathematical Statistics I and II

II. Related Studies 0-4 s.h.
 A maximum of 4 s.h. in courses offered by departments other than the mathematics department, but related to it, may be credited toward the M.S. Degree with major in mathematics with permission of the faculty adviser.

III. Research Requirement 4-8 s.h.
 A course in research in mathematics is required of all students, the purpose of which is to acquaint students with the mathematics literature and to develop skill in the use of this literature. Students will prepare a proposal for independent study or research to be pursued as a follow-up to this course. 2 s.h. will be granted

for the successful completion of the course. A minimum of 2 additional s.h. in this area will be required. 2 s.h. credit will be granted if a student completes a written paper, after independent study with faculty guidance, on some area of mathematics that has not been studied in the regular course offered, and that has been deemed acceptable by the designated member or members of the Mathematics Staff. If the proposal made by the student in the Research course is acceptable as satisfactory for thesis work, a maximum of 6 s.h. beyond the Research course may be granted after successful completion of the proposed study.

The course in Research should be taken at or near the completion of the basic 14 s.h. of mathematics listed in part I.

Course Descriptions

Math 501 Digital Computer Programming (FORTRAN) 2 s.h.

Principles of programming electronic digital computers; development of programs in the FORTRAN language; compilation and execution on College computer. (Elective—does not apply toward minimum requirements for concentration in Mathematics.)

Math 502 Digital Computers and Compiler Systems 2 s.h.

Development of digital computers; description of present-day computers and the symbolic programming and compiler systems available for program development. (Elective — does not apply toward minimum requirements for concentration in Mathematics.) Prerequisite: Math 501.

Math 503 Seminar: Computer Applications in Research 2 s.h.

Description of general techniques to facilitate processing of research data on a digital computer; special attention to individual research problems of class members. (Elective—does not apply toward minimum requirements for concentration in Mathematics.)

Math 507 Numerical Analysis 2 s.h.

This course is concerned with techniques of employing computers to solve problems. The topics covered will include approximation of functions by Taylor Series, iterative methods of solving equations, solutions of systems of equations, interpolation, numerical differentiation and integration, and numerical solution of ordinary differential equations.

**Math 510 Seminar in Mathematics I
(Junior High School Mathematics) 2 s.h.**

This course will acquaint the student with recommended curricula for the 7th, 8th, and 9th grades in Mathematics. Emphasis will be placed on programs for the slow, the average, and the gifted learners. Students will work on individual projects. Prerequisite: Permission of instructor.

**Math 511 Seminar in Mathematics II
(Senior High School Mathematics) 2 s.h.**

This seminar will acquaint the student with recommended curricula for the 10th, 11th, and 12th grades in Mathematics. Emphasis will be placed on updating curricula. Special attention will be given to teaching topics of equations, inequalities, sets, functions, relations, and a modern approach to the teaching of geometry and trigonometry at the secondary school level. Prerequisite: Permission of instructor.

Math 529 Differential Equations 2 s.h.

This course is designed to bridge the gap between the elementary theory of differential equations and the study of advanced techniques. It provides a vigorous survey of those topics which are most useful in the exact sciences. Some of the topics covered in this course are: an introduction to phase-plane analysis of non-linear oscillations, numer-

ical integration and difference approximations, and Sturm-Liouville systems. Prerequisites: An undergraduate course in differential equations and advanced calculus, or their equivalents.

Math 530 Partial Differential Equations

2 s.h.

This course deals with linear partial differential equations of the second order, with equations solvable by separation of variables and with approximation methods of solution. Numerous applications from engineering and the physical sciences are included in the course. Prerequisites: Advanced Calculus, Ordinary Differential Equations (one semester of each).

Math 531-532 Advanced Calculus I, II

4 s.h.

These courses are the basis for advanced analysis. Topics include structure of the real number system, functions, sequences, limits, continuity, differentiation, integration, infinite series of constants, and power series.

Math 533-534 Functions of a Complex Variable I, II

4 s.h.

These courses include a study of the properties of complex numbers and functions, including: analytic and elementary functions, the Cauchy-Goursat integral theorem, contour integrals, power series, residues and poles, conformal mappings, Schwarz-Christoffel transformation, and analytic continuation. Prerequisite: Math 531.

Math 535-536 Functions of a Real Variable I, II

4 s.h.

These courses develop further the topics of Math 531 and 532. Point sets, uniform continuity, Stieltjes integration, uniform convergence, and functions of several variables are among the topics discussed. Prerequisite: Math 532.

Math 539-540 Infinite Series I, II

4 s.h.

A development of the theory of the convergence of series. Among the topics considered are: sequences; series of positive, arbitrary, and variable terms; double series, power series, types of convergence and the associated operations with series. Prerequisite: Math 532.

Math 543-544 Vector Analysis I, II

4 s.h.

These courses will include the algebra and calculus of vectors with application to various physical and geometrical problems. Definitions of line and surface integrals and their application to special physical and engineering problems will be included.

Math 552 Number Theory

2 s.h.

Topics considered will include: elementary properties of integers, Euclidean algorithm, Prime Numbers, Divisibility, Congruences, Residues and Diophantine equations.

Math 561-562 Abstract Algebra I, II

4 s.h.

This course is designed to continue the study of the axiomatic structure of algebra to which the student has been introduced in previous courses. This will consist of an intensive study of the properties of groups, rings, ideals, integral domains and fields. Vectors and vector spaces, the theory of matrices and linear transformations, linear spaces and linear and bi-linear forms will be studied.

Math 563-564 Linear Algebra I, II

4 s.h.

Theory of vector spaces and linear transformations. Matrices and determinants. Introduction to linear algebras.

Math 565 Theory of Groups

2 s.h.

Abstract group theory with emphasis on finite groups, quotient groups as a basis for Galois Theory, derived groups, nilpotence, extension, and products will be considered. Prerequisite: Math 561.

Math 570 Point Set Theory**2 s.h.**

This course is a study of the basic concepts of set theory. The course includes a brief discussion of logic and proof followed by the essentials of set theory, the set approach to relations and functions, finite and infinite sets, and cardinal and ordinal numbers. This course serves as a partial basis for advanced courses.

Math 571-572 Modern Geometry I and II**4 s.h.**

A systematic analysis of geometry through a study of axiomatic, synthetic and analytic projective geometry. Affine, Euclidean, and non-Euclidean geometries are obtained by successive restrictions of projective transformations.

Math 573-574 Topology I, II**4 s.h.**

An introduction to point set topology and those properties of topological spaces invariant under homeomorphisms such as compactness, connectedness, etc.

Math 575-576 Projective Geometry I, II**4 s.h.**

Discussions will concern: projection and section, ideal elements, projectively related forms, harmonic sets and resulting metric properties, polarity, involution, and conic sections from a projective standpoint.

Math 580 Logic**2 s.h.**

An introduction to symbolic logic, including quantification theory, and its value in determining the validity of mathematical arguments.

Math 582 Theory of Probability**2 s.h.**

This course develops probability theory as a mathematical model. The models studied are: Bernoulli, binomial, Poisson and normal. Distributions of sums of independent random variables are derived by means of probability and moment generating functions. One form of the central limit theorem is derived. Numerous practical illustrations are supplied. Prerequisite: Differential and Integral Calculus.

Math 584 Mathematical Statistics I**2 s.h.**

The science of statistics is presented as decision theory, where, for the most part, decisions are made concerning populations as a result of incomplete sample data. This course deals with estimation of population parameters and testing hypotheses about populations. The populations used for study are those described in the description of Math 582. In addition, the Chi-square distribution is derived. Except where exact distributions are already known, this course concerns itself with large sample theory. Numerous practical illustrations from different fields are supplied. Prerequisite: Math 582 or its equivalent.

Math 585 Mathematical Statistics II**2 s.h.**

This course is a continuation of Math 584. Student's *t* and the *F* distribution are derived for use in small sample testing. Correlation and regression are studied via the bivariate normal distribution. An introduction to analysis of variance and some nonparametric methods of testing hypotheses are presented. Numerous practical illustrations from different fields are supplied. Prerequisite: Math 584.

Math 600 Methods of Research in Mathematics**2 s.h.**

The purpose of this course is to acquaint students with the mathematical literature and to develop skill in the use of this literature. A proposal for independent study or research will be required. (Formerly Math 590)

Math 690 Research Problems in Mathematics**2-6 s.h.**

An individual study under the guidance of a faculty member in some area of mathematics which has not been studied in the student's regular courses. (Formerly Math 591-593)

Grad 550 Research and Thesis**2-10 s.h.**

MATHEMATICS FOR THE ELEMENTARY SCHOOL TEACHER

Willard Henneimann, Director

Edwin Bailey

Jo Anne Mueller

Mildred Reigh

This program, leading to a Master of Education Degree in Mathematics for Elementary School Teachers, is designed to give the elementary school teacher both depth and breadth in the mathematical concepts essential to a contemporary school mathematics program. The sequence of the courses listed below will prepare the student to serve as a resource person for the elementary school mathematics program within his school or school district. These courses are not open to students enrolled in the M.Ed. or M.S. programs in mathematics.

To be eligible for admission to the program, applicants must possess a Provisional Pennsylvania College Elementary Teacher's Certificate or its equivalent as well as meet the other general requirements for admission to the Graduate School.

Upon admission to the program, each student will be assigned a course adviser by the Chairman of the Mathematics Department. Together they will plan a program which is best suited to the student's background and professional aspirations. Thus, a student who has completed a concentration in mathematics as an undergraduate would be expected to start his course work in the Subject Matter Concentration Area with second level courses (ElMath 504 or 506), while a student with less background would start with courses at the first level (ElMath 501 or possibly ElMath 503).

Grad 515, Elements of Research, should be scheduled early in the program to give the student ample time to fulfill the research requirement. After completing this course, the student should request from the Chairman of the Mathematics Department that a research adviser be assigned. Depending on the student's research topic, the research adviser may or may not be the same person as the student's course adviser. The research adviser will be assigned after consultations between the student, his course adviser, the Chairman of the Mathematics Department and the prospective research adviser result in the selection of a research topic by the student. The research adviser will then assist the student in preparing and presenting his thesis or research project.

CURRICULUM FOR THE MASTER OF EDUCATION IN MATHEMATICS FOR ELEMENTARY SCHOOL TEACHERS DEGREE PROGRAM

I. Subject Matter Concentration Areas: (at least 18 semester hours of work will be required from the following:)

A. Mathematics (at least 14 semester hours are required from this area)

ElMath 501	Basic Concepts in Mathematics I (Elementary Majors only)	2 s.h.
ElMath 502	Basic Concepts in Mathematics II (Elementary Majors only)	2 s.h.
ElMath 503	Foundations of Algebra I	2 s.h.
ElMath 504	Foundations of Algebra II	2 s.h.
ElMath 505	Principles of Geometry I	2 s.h.
ElMath 506	Principles of Geometry II	2 s.h.
ElMath 507	Coordinate Geometry and Trigonometry I	2 s.h.
ElMath 508	Coordinate Geometry and Trigonometry II	2 s.h.
ElMath 509	Introduction to Number Theory	2 s.h.
ElMath 510	Introduction to Logic and Boolean Algebra	2 s.h.

ElMath	511	Introduction to Computing Machines and Their Uses	2 s.h.
ElMath	512	Introduction to Probability and Statistics	2 s.h.
ElMath	513	Calculus I	2 s.h.
ElMath	514	Calculus II	2 s.h.
ElMath	515	Intuitive Topology	2 s.h.
Math	582	Theory of Probability	2 s.h.
Math	584	Mathematical Statistics I	2 s.h.

B. Related Studies: 4 semester hours of work in this area may be counted as part of the subject matter concentration with permission of the faculty adviser. These should include ElSc 530 with additional courses selected from the other courses listed below.

ElSc	530	Quantitative Tools for Elementary Science	2 s.h.
ElSc	540	Chemistry I	2 s.h.
ElSc	541	Chemistry II	2 s.h.
ElSc	550	Physics I	2 s.h.
ElSc	551	Physics II	2 s.h.

II. Professional Studies (at least 8 semester hours including ElMath 520 and a Research Paper or Thesis)

LRes	500	Seminar in Learning Resources	2 s.h.
Grad	516	Statistical Methods I	2 s.h.
Grad	517	Statistical Methods II	2 s.h.
Grad	550	Thesis	2-4 s.h.
El	531	Curriculum Problems in Elementary Education	2 s.h.
El	543	Resource Materials in Elementary Science	2 s.h.
El	548	Creativity and the Elementary School Child	2 s.h.
El	551	Recent Innovations in Elementary Education	2 s.h.
El	552	Evaluating the Elementary School	2 s.h.
El	553	Supervision and Improvement of Instruction in the Elementary School	2 s.h.
El	533	Reading Disabilities of Elementary School Children	2 s.h.
El	555	Advanced Human Development and Learning	2 s.h.
Psy	531	Psychology of the Exceptional Child	2 s.h.
Psy	532	Studies in Pupil Adjustment	2 s.h.
ElMath	520	Curriculum and Instruction in Elementary School Mathematics Programs	2 s.h.

III. Foundations of Education—two (2) semester hours of work to be selected from the following courses:

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

IV. Research Techniques—one of the following courses is required. It should be scheduled early in the student's program.

Grad	515	Elements of Research	2 s.h.
or			

Math	600	Methods of Research in Mathematics	2 s.h.
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Course Descriptions

ElMath 501 Basic Concepts in Mathematics I (Formerly Math 521)

2 s.h.

This course is designed for students who as undergraduates have not taken Math 160 or an equivalent course.

Some of the topics included in this course are: Sets; relations and functions; cardinal number concept; system of whole numbers; rationale for traditional computational algorithms; numeration systems; primes; factorization; Fundamental Theorem of Arithmetic; tests for divisibility; nonmetric geometry and mathematical systems.

ElMath 502 Basic Concepts in Mathematics II 2 s.h.

This course is a continuation of ElMath 501 and is designed for students who have not taken Math 520 or an equivalent course as undergraduates. Topics to be considered: The systems of integers, rational numbers and real numbers; rationale for traditional computational algorithms; absolute values; fractions and decimal notation, ratio; percent; proportion; completeness; metric geometry; geometric constructions; introduction to plane coordinate geometry; informal probability and topology. Prerequisite: ElMath 501.

ElMath 503 Foundations of Algebra I 2 s.h.

This course will include topics touched upon in earlier courses, but from a more rigorous and abstract approach. Topics to be considered are: Algebraic structures, such as groups, rings and fields; the Real Number System as a complete ordered field; solution sets and their graphs for equations and inequalities; real functions and relations as a unifying concept; and, if time permits, the Complex Number System as an extension of the Real Number System. The spiral development of algebraic concepts will be stressed throughout the course. Prerequisite: ElMath 502 or an equivalent undergraduate course.

ElMath 504 Foundations of Algebra II 2 s.h.

This course is intended to extend and enlarge upon the concepts developed in ElMath 503. Topics to be considered: Polynomial equations in the Real Number System and over other fields; an introduction to the history and theory of equations; the complex numbers as a field; more on algebraic structures; real functions and their graphs. The spiral development of algebraic concepts will be stressed throughout the course. Prerequisite: ElMath 503 or an equivalent undergraduate course.

ElMath 505 Principles of Geometry I 2 s.h.

This course includes a discussion of such topics as: congruences; measurement; parallelism; similarity; construction of proofs; practical applications; elements of spherical and solid geometry (introduction and intuitive approach) and constructions. The newer notation, vocabulary and approach when teaching these topics in elementary schools will also be discussed. Prerequisite: ElMath 502 or an equivalent undergraduate course.

ElMath 506 Principles of Geometry II 2 s.h.

This course will extend and enlarge upon concepts developed in ElMath 505. Topics to be considered: indirect proofs; more complicated constructions; centroids; translations and rotations in the plane; elements of solid geometry such as polyhedra, cones, cylinders; and some spherical geometry such as lunes, zones and wedges. Also, modern geometries such as topology, finite geometries, and other non-Euclidean geometries will be introduced. Prerequisite: ElMath 505 or an equivalent undergraduate course.

ElMath 507 Coordinate Geometry and Trigonometry I 2 s.h.

ElMath 507 and ElMath 508 are intended to give a foundation in fundamental topics from trigonometry and analytic geometry. Topics considered in ElMath 507: trigonometric functions and other periodic functions and their graphs; solution of trigonometric equations; inverse functions and their graphs; the Complex Number System as a vector space. Prerequisite: ElMath 503 or an equivalent undergraduate course.

ElMath 508 Coordinate Geometry and Trigonometry II 2 s.h.

ElMath 508 will extend the investigation of real relations and their graphs to include linear functions and their graphs, relations whose graphs are the conic sections; systems of equations and their

graphs, polar coordinate systems, transformations of coordinate systems, and other related topics. Prerequisite: ElMath 507 or an equivalent undergraduate course.

ElMath 509 Introduction to Number Theory**2 s.h.**

This course will pay special attention to representations of the real numbers in various numeration systems; factorization and the primes; congruences and modular arithmetic. Other topics to be investigated: linear diophantine equations; continued fractions and number theoretic functions. Prerequisite: ElMath 503.

ElMath 510 Introduction to Logic and Boolean Algebra**2 s.h.**

This course is an introduction to some of the basic ideas, terminology and notation of logic and Boolean Algebra. Topics considered: symbolic logic, with special emphasis on those portions of logic which depend heavily upon the algebra of propositions; other applications of Boolean Algebra such as the algebra of sets, the algebra of switching circuits; an introduction to quantification theory and its value in determining the validity of mathematical arguments. Prerequisite: ElMath 503.

ElMath 511 Introduction to Computing Machines and Their Uses**2 s.h.**

This course is intended to introduce the student to computing machines and techniques which could have implications for the contemporary elementary school mathematics curriculum. Topics include: an understanding of the construction and uses of nomograms; slide rules; desk calculators and the high speed digital computer. A brief introduction to computer programming will also be a feature of the course. Prerequisite: ElMath 503.

ElMath 512 Introduction to Probability and Statistics**2 s.h.**

This course is designed to introduce students to the fundamental concepts of probability which will enable them to analyze data and make predictions from population samples. Special attention will be given to the binomial and the normal frequency distributions, measures of central tendency, variation sampling estimation, testing hypotheses, and linear correlation and regression. Prerequisite: ElMath 503.

ElMath 513 Calculus I**2 s.h.**

Topics will include: differential calculus of polynomials and rational functions; anti-derivatives and integrals of polynomials; techniques of differentiation and integration. Intuitive notions and applications will be stressed. Prerequisite: ElMath 508.

ElMath 514 Calculus II**2 s.h.**

Topics include differential and integral calculus of algebraic and transcendental functions with applications. Intuitive notions and applications will be stressed. Prerequisite: ElMath 513.

ElMath 515 Intuitive Topology**2 s.h.**

This course will introduce the student to selected topological concepts from the intuitive, rather than the axiomatic viewpoint. These concepts will be introduced, discussed and used informally on the basis of the student's experience. Formal definitions of these concepts will be given where the intuitive basis is not sufficiently precise. Topics considered: networks and maps; topological equivalence in three-dimensional space; maps on a sphere with handles; The Jordan Curve Theorem; topological transformations and spaces. Prerequisite: ElMath 514.

EIMath 520 Curriculum and Instruction in Elementary School Mathematics Programs

2 s.h.

This course is designed to give the elementary school teacher experience with the literature, equipment and materials used in teaching mathematics with its new emphases in the elementary schools. Experimental programs in contemporary mathematics such as the Madison Project, SMSG, Greater Cleveland Mathematics Program and the Minnemast Project will be examined and discussed. Criteria to be considered in the selection of suitable texts for elementary school mathematics programs and ways of implementing a contemporary mathematics program in a school district will be discussed. Investigation, discussion, demonstration, and evaluation of materials and programs will be a part of each person's activity. Prerequisite: Math 502 and consent of the instructor.

MUSIC AND MUSIC EDUCATION

Hugh B. Johnson, Chairman

William R. Becker
 Robert E. Bernat
 David T. Borst
 Wallis D. Braman
 Mary Lou Brecker
 Robert W. Burggraf
 Catherine C. Carl
 Christina Cha
 Charles A. Davis
 Ruth De Cesare
 Daniel Di Cicco
 Gladys Dunkelberger
 Olive M. Fornear
 Walter O. Golz
 Arvilla T. Harrold
 H. Eugene Hulbert
 Dominic Intili
 Robert Lloyd

C. David McNaughton
 Delight Malitsky
 Russell C. Nelson
 Gary J. Olmstead
 Jane Olmstead
 Laurence J. Perkins
 Daniel Perlongo
 Peter J. Popiel
 Robert D. Reynolds
 Nicolo Sartori
 Ann Staples
 James Staples
 Elizabeth D. Stewart
 Lawrence C. Stitt
 Richard E. Thorell
 Suzanne Thorin
 Eva Vouklizas
 J. Herbert Wildeboor

The major purpose of the Graduate program in Music is to provide the student with opportunities to improve his skills as teacher, performer or scholar beyond the bachelor's degree. Upon acceptance by the Graduate School, each student may request or will be assigned by the Chairman of the Department of Music an adviser who will oversee his progress, help to plan his sequence of courses, and who will be responsible for the formation of his thesis or recital committee. For details, the student should consult the Student Handbook of the Department of Music.

Prerequisite: Undergraduate degree with major in music or its demonstrated equivalent.

Entrance Requirement: Placement examinations will be required in theory, music history, piano proficiency and principal performing medium. The adviser will use the results of these examinations to determine areas of deficiency and to prescribe specific electives.

CURRICULUM FOR MASTER OF ARTS IN MUSIC

Major Offerings: (a) Music History and Literature, (b) Music Theory and Composition, (c) Music Performance.

Credit Hours Required: 30 semester hours

I. Core courses prerequisite for further study and required of all candidates for M.A. degree:	
Mus 500 Bibliography of Music	3 s.h.
Mus 516 Analytical Techniques	3 s.h.
Grad 515 Research Techniques	2 s.h.
	8 s.h.

II. Additional Requirements:

A. Music History and Literature Major	
Grad 550 Thesis	4 s.h.
B. Music Theory and Composition Major	
Grad 550 Thesis or Composition	4 s.h.
C. Music Performance Major	
Mus 540-612 Applied Music	12 s.h.
Grad 550 Recital	4 s.h.

III. Electives:

A. Music History and Literature Major 18 s.h.
 (Twelve semester hours should be in major area)

B. Music Theory and Composition Major 18 s.h.
 (Twelve semester hours should be in major area)

C. Music Performance Major 6 s.h.
 (None may be taken in Applied Music)

**CURRICULUM FOR MASTER OF EDUCATION
IN MUSIC EDUCATION**

Students working for this degree will complete thirty (30) semester hours of work in accordance with the following divisions:

I. Subject Matter Concentration Area:**A. Core Courses—prerequisite to further study:**

Mus 500 Bibliography of Music 3 s.h.
 Mus 516 Analytical Techniques of Music 3 s.h.
 B. Mus 540-612 Applied Music 4 s.h.
 C. Grad 550 Thesis or Recital 4 s.h.
 D. Elective Courses 12 s.h.

To be chosen on the basis of placement examinations from current course offerings of the Music Department. Eight (8) semester hours should be in Music Education.

II. Foundations of Education 2 s.h.

One of the following courses is to be chosen:

Ed 511 Historical Foundations of Education (2 s.h.)
 Ed 512 Philosophical Foundations of Education (2 s.h.)
 Ed 513 Social Foundations of Education (2 s.h.)

III. Research Techniques—the following course is required. It should be scheduled early in the student's program:

Grad 515 Elements of Research 2 s.h.
 30 s.h.

COURSE DESCRIPTIONS

Mus 500 Bibliography of Music 3 s.h.

The aim of the course is to introduce graduate students to the various types of music, music literature and bibliographical tools which exist and which may be used in research in music. Through weekly research projects the student will become acquainted with the widest possible range of bibliographical materials in music. As a project, each student will prepare an extensive annotated bibliography of a musical subject within his special interest.

Mus 501 Advanced Choral Conducting 2 s.h.

An evaluation of each individual's conducting technique will be made and developmental procedures introduced. Material for this process will include large choral works with and without accompaniment. The student will be expected to further develop skills in reading score.

Mus 502 Advanced Instrumental Conducting 2 s.h.

An intensive study of large instrumental works will be developed especially treating the specific conducting techniques necessary to the successful performance of these compositions. The skill development of each individual will be stressed.

Mus 503 Music of the Baroque Era 3 s.h.

A survey of music from about 1600 to about 1750.

Mus 504 Music of the Classic Era	3 s.h.
A survey of music from about 1725 to about 1827.	
Mus 505 Music of the Romantic Era	3 s.h.
A survey of music from about 1800 to about 1910.	
Mus 507 Music of the 20th Century	3 s.h.
A survey of the principal stylistic trends in music from 1900 to the present.	
Mus 508 Music of the 16th Century	3 s.h.
A survey of music from about 1500 to about 1600.	
Mus 509 Biography	3 s.h.
A study of the life and works of a single composer in detail. The specific composer will be chosen by the instructor. The course may be repeated once for a total of two Biography courses of different composers.	
Mus 510 Seminar in Music Literature	3 s.h.
The subject matter will change each semester at the pleasure of the instructor. Students will make presentations and write an extensive research paper. The seminar may be repeated for credit any number of times. Topics will be chosen so that an in-depth study can be made of narrowly defined areas, such as "Early Romantic Piano Music," "The Music Drama of Wagner," "Electronic Music," etc.	
Mus 511 Composition	2 s.h.
Composition of Music in the various song forms through the rondos and the larger sonata allegro form. The student will be guided in his compositional attempts by careful analysis of similar forms of major composers. Instruction will be highly individualized as to the forms attempted and will depend considerably on the personal interest of the student.	
Mus 512 Advanced Orchestration	2 s.h.
Consideration will be given to the problems of scoring for the full symphony orchestra as well as the string orchestra and the chamber orchestra. Students will be expected to produce a full score and orchestral parts so that the orchestration may be tested by actual playing by the University Symphony.	
Mus 513 Advanced Band Scoring	2 s.h.
The problems of scoring for the modern concert band will be considered in detail. Actual scoring for the full symphonic band will be one of the major projects of the course. In addition, the problems of scoring for the brass band, the woodwind choir, and the percussion ensemble will also be considered. Scores and band parts for all projects will be produced by the students for an actual test playing by the University Symphonic Band.	
Mus 514 Advanced Choral Arranging	2 s.h.
Four-part writing for chorus will be reviewed. Five, six, seven, and eight-part writing will comprise the large part of the course. Special consideration will be given to the problem of writing for men's voices and for women's voices. All projects of the class will be duplicated in full choral score for actual test performance by one of the major vocal groups of the University.	
Mus 515 Canon, Double Counterpoint, and Fugue	2 s.h.
The application of contrapuntal techniques through analysis and creative writing. Included will be the study and writing of two- and three-voice canons; two- and three-part inventions; and two-, three-, and four-voice fugues.	

Mus 516 Analytical Techniques

3 s.h.

A study of representative compositions of various periods, with emphasis on formal harmonic and stylistic analysis. The student will develop the basic analytical techniques necessary for the analysis of music of any period.

Mus 517 Acoustics of Music

2 s.h.

This course is designed for graduate students in Music. It will explore the nature and transmission of sound, the vibratory characteristics of musical instruments and the human voice, the ear and the psychology of hearing, the evolution of the Western tempered-scale, and the dimensions and materials of concert hall construction.

Mus 521 Music Literature and Materials

2 s.h.

(NON-MUSIC MAJORS ONLY)

(see Elementary Education Program)

The purpose of this course is to further enhance the musical background of the elementary teacher through acquaintance with suitable literature and materials.

Mus 528 Contemporary International Approaches to**Elementary Music Education**

2 s.h.

An introduction to new developments in elementary music education practices based on the techniques originated by Carl Orff in Germany, Zoltan Kodaly in Hungary and Shinichi Suzuki in Japan. Authentic adaptations of music and materials will be used in lecture, demonstration and workshop situations.

Mus 529 Advanced String Pedagogy

2 s.h.

Study of the specific techniques and problems of teaching violin, viola, cello, and double bass in both individual and class situations.

Mus 531 Administrative Problems in Music Education

2 s.h.

A review of the conventional administrative organization of music education in the public schools. The role of the music director, the music specialist, the consultant, and the music resource teacher will be carefully defined. Consideration will be given to the problems of scheduling in the public school. Current issues concerned with music education and public education in general will be considered, including curriculum development.

Mus 532 Seminar in Music Education

2 s.h.

There will be a considerable amount of freedom in the development of this course. The content each time it is offered will be governed by the specific needs of the students programming the course. These needs will be of two general classes: (1) strengthening areas of weakness, (2) exploring further areas of interest.

Mus 533 Comparative Choral Methods

2 s.h.

Materials and procedures of the preparation of vocal groups for public performance. Several accepted, yet contrasting, approaches will be considered, ranging from the Christiansen technique to that of John Finley Williamson. Special attention will be given to program building.

Mus 534 Comparative Instrumental Methods

2 s.h.

Consideration will be given to those materials and procedures which have been proven by actual use in the United States. These various approaches will be compared and given a critical analysis by the class. Rehearsal techniques, efficient use of time and basic motivation will be stressed. The development of interesting programs will be considered.

Mus 535 Psychology of Music Education

2 s.h.

An analysis of the latest evidence produced by the field of psychology in music education as applied in actual classroom situations.

A review of the latest developments in psychological research relating to specific education problems will be included.

Mus 537 Techniques of the Marching Band 2 s.h.

The theory and practical application of the fundamentals of precision drill will be studied in detail. Also, this course deals with building "half-time shows," materials and instrumentation of the marching band.

Mus 538 Marching Percussion Workshop 1-2 s.h.

Mus 539 Vocal Workshop—The Biolinguistic Approach 2 s.h.

The emphasis of study is placed upon the physiological structure and nature of singing in terms of the complete correlation and co-ordination of anatomy and psychology with performance, analysis, and training. Lectures will be augmented by moving pictures, charts, plastic models, and slides. Some sessions will be devoted to performance by soloists from the class with analysis and suggestions for improvement being made by the Director. This will be a practical, functional course correlating the latest scientific knowledge to the immediate needs of workshop members and of those they teach.

Applied Music (ApplMus 501-670) 1-6 s.h.

The following courses will be taught in the form of private lessons geared to the individual student and aiming at maximum progress of each student, depending on the background of the student and the time available. The student should for any series of lessons use the first number in programming for the first time, the second number for the second time, etc.

ApplMus 501, 551, 601, 651 Private Piano (Fornear, Golz, Harold, Malitsky, Sartori, Vouklizas)

ApplMus 502, 552, 602, 652 Private Organ (Carl)

ApplMus 503, 553, 603, 653 Private Harpsichord (Staples)

ApplMus 504, 554, 604, 654 Private Harp

ApplMus 505, 555, 605, 655 Private Voice (Cha, Dunkelberger, Nelson, Stewart, Wildeboor)

ApplMus 506, 556, 606, 656 Private Violin (Malitsky)

ApplMus 507, 557, 607, 657 Private Viola (Perkins, Malitsky)

ApplMus 508, 558, 608, 658 Private Cello (Olmstead)

ApplMus 509, 559, 609, 659 Private Bass Viol (Braman)

ApplMus 510, 560, 610, 660 Private Flute (Bracker)

ApplMus 511, 561, 611, 661 Private Clarinet (DiCicco, Stitt)

ApplMus 512, 562, 612, 662 Private Oboe (Lloyd)

ApplMus 513, 563, 613, 663 Private Bassoon (Borst)

ApplMus 514, 564, 614, 664 Private Saxophone (Lloyd)

ApplMus 515, 565, 615, 665 Private Trumpet (Becker)

ApplMus 516, 566, 616, 666 Private French Horn (McNaughton)

ApplMus 517, 567, 617, 667 Private Trombone (Thorell)

ApplMus 518, 568, 618, 668 Private Baritone Horn (Popiel)

ApplMus 519, 569, 619, 669 Private Tuba (Popiel)

ApplMus 520, 570, 620, 670 Private Percussion (Olmstead)

PHILOSOPHY

Robert M. Hermann, Chairman

Graduate courses in Philosophy are primarily designed to provide elective study in an unfamiliar discipline for students teaching in the public schools. No graduate degree in Philosophy is offered. Degrees toward which credit in these courses may be used are indicated in the curriculum requirements sections of the catalog. Research or thesis work may be done in Philosophy with approval of the student's major program adviser.

Phil 580 Readings in Religious Thought 2 s.h.

An examination of basic problems in the philosophy of religion: defining "religion," arguments for the existence of God, conceptions of Deity, claims and sources of religious knowledge, the logic of religious language, humanistic naturalism as theology, religion and morality, the problem of evil.

Phil 581 Problems in Logic 2 s.h.

An analysis of problems in meaning, of the formal structure of arguments, and of empirical inquiry. Semantics, syntactics, and empirics. Fallacy. (Staff)

Phil 582 Problems of Ethics 2 s.h.

The rational justification of moral judgments. Analysis of the function and meaning of moral language. (Staff)

Phil 583 American Philosophic Thought 2 s.h.

A study of the more influential and original philosophies developed in America from the colonial period to the present. (Staff)

Phil 584 Philosophy Seminar 2 s.h.

Area research in the discipline, considering various facets of a central problem. Students doing a thesis or research project in Philosophy will register for this course. (Staff)

PHYSICS

Richard E. Berry, Chairman

Gary Buckwalter, Director of Graduate Studies

Jerry Eddy
 Ming Lu
 Patrick McNamara
 John Matolyak
 George Matous

Marilyn Noz
 Daniel Reiber
 David Riban
 Richard Roberts
 Dennis Whitson

Patsy Zitelli

The graduate program in Physics offers a choice of two degrees. The degrees are a Master of Education with a major in Physics and a Master of Science with a major in Physics. The student obtaining a master's degree for fulfillment of certification requirements will usually select the Master of Education Degree. The student obtaining a master's degree for additional preparation for research or further graduate work will usually select the Master of Science Degree. Curriculum and requirements for these degrees are described in this bulletin.

With a wide range of possible courses and research areas available, the student is required to have the consent of his departmental adviser before selecting a course or initiating a research project. Adviser assignments are made as soon as the acceptance of a graduate student reaches the Physics Department. The graduate student should arrange appointments with his adviser by contacting the secretary in the Physics Office.

The Theoretical Physics courses are prerequisites for about half of the more advanced courses and should be taken at the first opportunity. Theoretical Physics I may not be required of students who have an adequate background in applied differential equations. Math 357 is a satisfactory substitute for our recent graduates. This should be discussed with your Physics adviser before programming.

Curriculum for Master of Education Degree

To major in Physics, the student must have had at least General Physics, Atomic and Nuclear Physics, Electronics, Mechanics I and Optics or their approved equivalents as well as Mathematics through the equivalent of Analytic Geometry and Calculus II.

Students working for this degree will complete the thirty semester hours of work in accordance with the following divisions:

I. Subject Matter Concentration—Sixteen to twenty-two (16-22) semester hours from the offerings under A and B.

A. Required Courses

Phys 502 Theoretical Physics I 2 s.h.
 Note: Not required of students who have credit
 for Math 357 or its equivalent.

Phys 503 Theoretical Physics II 2 s.h.
 Phys 512 Curriculum Developments in Secondary
 School Physics 2 s.h.

Phys 521 Advanced Laboratory Practice I 2 s.h.
 OR

Phys 522 Advanced Laboratory Practice II 2 s.h.
 Phys 542 Analytic Mechanics II 2 s.h.

Phys 551 Electricity and Magnetism I 2 s.h.
 Phys 552 Electricity and Magnetism II 2 s.h.

Note: Phys 551 and 552 will not be required of
 students who have taken Phys 322 and
 323 after Sept. 1966.

Phys	561	Quantum Mechanics I	2 s.h.
Phys	565	Introduction to Nuclear Physics	2 s.h.
Sci	576	Growth of Science and Its Concepts II	2 s.h.

B. Elective Courses

Phys	511	Secondary School Physics Laboratory Practices	2 s.h.
Phys	521	Advanced Laboratory Practice I	2 s.h.
Phys	522	Advanced Laboratory Practice II	2 s.h.
Phys	533	Thermodynamics	2 s.h.
Phys	535	Electronics	4 s.h.
Sci	575	Growth of Science and Its Concepts I	2 s.h.
Any Graduate courses offered by the Mathematics or Natural Science Departments.			

II. Research Techniques

The following course is required. It should be scheduled very early in the student's program.

Grad	515	Elements of Research	2 s.h.
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III. Foundations of Education

One course must be selected from these offerings:

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

IV. Thesis or Research Project

A thesis or research project is required of each student. The thesis may earn from two to four hours credit.

Grad	550	Thesis	2-4 s.h.
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A research project fulfills this requirement, but does not earn any semester hour credit.

V. Free Electives

The student may complete the thirty semester hour requirement by choosing from among any of the offerings of the graduate school, with, of course, the advice and approval of his graduate adviser. The student must satisfy any stated prerequisites for the elective courses which he chooses.

Curriculum for the Master of Science Degree**I. Admission Requirements.** Any student meeting the requirements of the graduate school and having either a B.A. or a B.S. with the major in physics will be permitted to initiate study in this curriculum. Students having other degrees that provide sufficient preparation in mathematics and physics may be permitted to initiate study with approval of the Chairman of Physics. Each student is required to pass a preliminary examination based on undergraduate and first year graduate courses before he will be fully admitted to this degree program.**II. Subject Matter Concentration** 18 s.h.
A primary objective of this curriculum is to bring every degree candidate to a definite level of proficiency in Physics. To demonstrate the required level of proficiency, the passing of the following 600 level courses is required:

Phys	641	Advanced Mechanics I	2 s.h.
Phys	642	Advanced Mechanics II	2 s.h.
Phys	651	Advanced Electromagnetic Theory I	2 s.h.
Phys	652	Advanced Electromagnetic Theory II	2 s.h.
Phys	661	Quantum Mechanics II	2 s.h.
Phys	662	Quantum Mechanics III	2 s.h.

Some of the recent senior level courses in universities provide sufficient background for a very able student to pass the above courses. Usually the adviser will suggest that the student take

some of the 500 level courses in order to compensate for omissions in the student's preparation. A program of courses must be arranged with an adviser and be approved by the Physics Department.

III. Mathematics Concentration 6 s.h.
In consultation with his adviser, the student may take any course in the graduate program of the mathematics department to fulfill this requirement. The courses selected must be approved by the adviser and the Physics Department.

IV. Research Requirement 6 s.h.
Each Master of Science student is required to undertake an individual research problem under the direction of one of the Graduate Faculty. The 6 semester hour requirement is fulfilled by scheduling the following courses:
Phys 600 Methods of Research in Physics 2 s.h.
Grad 550 Research and Thesis 4 s.h.

V. Comprehensive Examination

Following the completion of the research requirement the student is required to pass a comprehensive examination on both research and required course requirements.

Course Descriptions

Phys 500 Special Studies

1-6 s.h.

A special topic may be offered at the discretion of the Department to fulfill a special necessity.

Phys 502 Theoretical Physics I

2 s.h.

This is a course in the application of mathematical methods to physical theory. Included will be a brief review of differential and integral calculus, series expansions, partial differentials and first-order linear differential equations.

Phys. 503 Theoretical Physics II

2 s.h.

Applications in theoretical physics of vector calculus, partial differential equations, Fourier series and Green's and Stokes' theorems. Prerequisite: Phys 502 or its equivalent.

Phys 504 Theoretical Physics III

2 s.h.

This course is to serve as a preparation in mathematical physics for graduate students. Included will be vector and tensor analysis, matrices, infinite series, complex variables, and the calculus of residues. Prerequisite: Permission of Department.

Phys 505 Theoretical Physics IV

2 s.h.

As a continuation of Phys 504 this course will cover second-order differential equations, Sturm-Liouville Theory, gamma functions, Bessel functions, Legendre functions and other special functions, Fourier series, integral transforms, integral equations and the calculus of variations. Prerequisite: Phys 504.

Phys 511 Secondary School Physics Laboratory Practice

2 s.h.

This course is designed not only to give the student training in the use of PSSC and Harvard Project Physics Laboratory materials, but also to increase his ability to make the laboratory a more effective teaching tool.

Phys 512 Curriculum Developments in Secondary School Physics

2 s.h.

This course will include an intensive study of the curriculum developments in Secondary School Physics, such as PSSC and HPP. The philosophy, methodology and cognitive theory behind each curriculum will be considered. The laboratory equipment, experiments, and visual aids for each will be studied in their proper setting.

Phys 521 Advanced Laboratory Practice I 2 s.h.

Measurements of radioactivity using G-M, gas-flow, scintillation and solid state detectors. Determination of half-lives, beta-ray energies by absorption studies and gamma-ray energies by single and multi-channel pulse-height analysis.

Phys 522 Advanced Laboratory Practice II 2 s.h.

The selection of experiments will depend upon the student's previous training and interest. Emphasis will be placed upon interpretation of data. Interferometry, spectrometry, microwave optics, NMR and mechanical vibrating systems are some of the areas in which work may be done.

Phys 531 Atomic Structure 2 s.h.

This course includes a brief review of fundamentals of electricity and magnetism. Following this, the major topics are charged particles, electron configurations, atomic spectra, atomic structure, waves and particles.

Phys 533 Heat and Thermodynamics 2 s.h.

Topics treated in this course include temperature, laws of thermodynamics, the Carnot cycle, entropy, properties of ideal gases and pure substances, low temperature physics and application of thermodynamic principles.

Phys 535 Electronics 4 s.h.

Kirchoff's laws are reviewed and applied to AC circuits. Tube and transistor amplifiers, oscillators, negative feed-back amplifiers and various power supplies are constructed in the lab. Dual-trace oscilloscopes and other advanced laboratory instruments are used to explore the properties of circuit elements and amplifiers.

Phys 541 Analytical Mechanics I 2 s.h.

Kinematics, particle dynamics, gravitation, free and forced harmonic motion. The treatment of these topics utilizes the vector calculus and the differential and integral calculus.

Phys 542 Analytical Mechanics II 2 s.h.

Dynamics of rigid bodies, waves and vibrations, applications of Fourier Series and LaGrange's Equations.

Phys 551 Electricity and Magnetism I 2 s.h.

Coulomb's Law, electrostatic potential, Gauss' Law, dielectrics will be presented using vector calculus in a modern field formalism. Prerequisite: Phys 503.

Phys 552 Electricity and Magnetism II 2 s.h.

Biot and Savart's Law, induced emf, vector potential, displacement current, special relativity and electromagnetic radiation will be presented using techniques introduced in Phys 551. Prerequisite: Phys 551.

Phys 561 Quantum Mechanics I 2 s.h.

An introduction to the basic theory of wave mechanics. Prerequisite: Phys 503.

Phys 565 Introduction to Nuclear Physics 2 s.h.

Radioactivity, nuclear structure, nuclear reactions and elementary particles. Prerequisite: Phys 503 and Phys 531 or its equivalent.

Phys 600 Methods of Research in Physics 2 s.h.

This course offers the student practical training in the special methods and materials of research in Physics. Emphasis is placed on types of research, use of Physics and Physics-related journals and library facilities. Prerequisite: Permission of Department.

Phys 634 Statistical Mechanics**2 s.h.**

Classical statistics and an introduction to Quantum statistics through both proper combinatorial procedures and theory of ensembles. Prerequisite: Phys 533 or equivalent.

Phys 641 Advanced Mechanics I**2 s.h.**

This course includes the following topics: LaGrange's Equations, Hamilton's Principle, Two body central force. Orthogonal Transformations, Euler Angles, Cayley-Klein parameters, Euler's Theorem. Prerequisite: Phys 312 or equivalent.

Phys 642 Advanced Mechanics II**2 s.h.**

Rigid body mechanics, including Angular Momentum, Euler's equations, Precessions, Special relativity, Covariant four dimensional formulation, Covariant Lagrangian formulation, Legendre transformation and Hamilton's Equations, Least Action Principle, Canonical Transformations, LaGrange and Poisson Brackets, Constants of Motion and Symmetry. Prerequisite: Phys 641 or equivalent.

Phys 651 Advanced Electromagnetic Theory I**2 s.h.**

Electrostatics employing mathematical tools of advanced calculus. The boundary value problem, Green's functions, multipole expansions, and applications of various series approximations.

Phys 652 Advanced Electromagnetic Theory II**2 s.h.**

Magnetostatics, Time dependent Electromagnetic fields. Radiation and the electromagnetic theory of optics, plasma physics.

Phys 657 Solid State Theory I**2 s.h.**

Introductions to Crystalline structures. Thermal, Electric and magnetic properties of solids. Prerequisite: Phys. 561.

Phys 661 Quantum Mechanics II**2 s.h.**

Wave mechanics including WKB approximation, representation, central forces, the Hydrogen Atom, Spin. Prerequisite: Phys 561 or Permission of Department.

Phys 662 Quantum Mechanics III**2 s.h.**

Linear Vector Spaces, Dirac Notation, Perturbation Theory, Born Approximation, Bound State and Time-Dependent Perturbations in Introduction to Scattering. Prerequisite: Phys 661.

Phys 690 Research Problems in Physics**2-6 s.h.**

Introduction to advanced research problems through individual assignment. Prerequisite: Permission of Department.

PSYCHOLOGY

Richard D. Magee, Chairman

Bruce D. Cartwright
Kenneth F. Edgar
David E. Grover

James K. Klinedinst
Stanley W. Lore
George B. Walz

Dr. Robert Jacobs

See Counselor Education and Special Education

Psy 530 Psychology of Growth and Development 2 s.h.

This course is designed to provide insight into how people grow and develop from infancy to old age. Maturation, learning and their interrelationships are studied. Physical growth patterns are noted along with emotional, intellectual, and social development with implications for the school, community and home. (Lore)

Psy 531 Psychology of the Exceptional Child 2 s.h.

See Special Education.

Psy 533 The Psychology of Personality 2 s.h.

A consideration of the varied approaches to the problems of understanding personality. The objective will be to give the student an overview of each of the methods of analyzing personality that has, over an extended period of time, withstood careful scrutiny and investigation. The course will undertake some measures of integration by indicating similarities among the various approaches. (Cartwright, Jacobs, Klinedinst)

Psy 534 Abnormal Psychology 2 s.h.

Theories of pathological behavior with reference to clinical and experimental data. (Edgar, Klinedinst)

Psy 535 Differential Psychology 2 s.h.

In this course stress is placed upon a study of individual differences and the impact of these differences upon learning rates, interests, and personality. (Cartwright)

Psy 536 Psychology of Learning 2 s.h.

In this course learning theories will be explored in terms of breadth, their historical development, and for their impact upon educational philosophy and educational practices. (Grover, Walz)

Psy 538 Psychology of the Gifted Child 2 s.h.

See Special Education.

Psy 539 Psychology of the Mentally Retarded Child 2 s.h.

See Special Education.

Psy 540 Advanced Mental Hygiene 2 s.h.

This course is designed to offer a comprehensive treatment of the basic principles of mental hygiene. Its major concern is the normal, reasonably well-adjusted individual. Special emphasis will be given to the influence of activities carried on in the home, the school, and the community in an effort to stress the importance of prevention in the maintenance of mental health. (Magee)

Psy 541 Individual Psychometric Techniques:

The Binet Scales

2 s.h.

Historical development, administration, scoring, and interpretation of the Stanford-Binet intelligence tests. Enrollment in this course will necessarily be limited, with priority assigned to advanced graduate students pursuing a regular program of study at this university. Programming will be by special arrangement. Prerequisite: Consent of the instructor and chairman of the program. (Staff)

Psy 542 Individual Psychometric Techniques:**The Wechsler Scales****2 s.h.**

Historical development, administration, scoring, and interpretation of the Wechsler intelligence tests. Enrollment in this course will necessarily be limited, with priority assigned to advanced graduate students pursuing a regular program of study at this university. Programming will be by special arrangement. Prerequisites: Consent of the instructor and chairman of the department. (Staff)

Psy 543 Introduction to Projective Techniques**2 s.h.**

This course is primarily concerned with the rationale, structure and theoretical background of projective devices. Necessary prerequisites would include background in personality theory and tests and measurements. (Edgar)

Psy 544 Advanced Learning Theories**2 s.h.**

A review of current research and theoretical developments in the psychology of learning. (Staff)

Psy 561 Advanced Psychological Practicum**1-4 s.h.**

Structured to provide the graduate student, qualified in either psychology or guidance, with a working experience in a clinical situation. The student will participate, under supervision, in educational, vocational, and personal advisement. Registration only with permission of the Director of the Psychological Clinic. (Staff)

Psy 565 Measurement of Interests and Personality**2 s.h.**

This course is concerned with an intensive study of selected interest inventories which illustrate different techniques of measurement and with the various instruments used to measure nonintellectual aspects of behavior, as for example, emotional adjustment, social relations, motivation, attitudes, and the like. Projective techniques will not be included in the study of "personality tests." (Edgar, Klinedinst)

SCIENCE

Dwight E. Sollberger, Director
Division of Natural Science and Mathematics

This degree is designed for teachers who are teaching General Science, for those who teach more than one science subject, and for those who have a deficiency in one or another of the fields of science. It may be to their advantage to be able to select courses from a variety of fields. The Master of Education degree with a major in Science should enable such teachers to upgrade their teaching by selecting suitable courses from the electives in the various fields listed under the Biology, Chemistry, Geoscience, and Physics headings. Students should study the prerequisites carefully to make sure they have the background for the courses they wish to take.

SCIENCE

Curriculum for Master of Education Degree

In order for a student to major in Science, he must have completed one year of undergraduate work in Biology, Chemistry, and Physics.

Students working for this degree with a major in Science will complete the thirty (30) semester hours of work in accordance with the following divisions:

I. Subject Matter Concentration Area—fourteen to twenty-two (14-22) semester hours of work in subject matter content is to be selected from the various courses in the major areas of Biology, Chemistry and Physics with the approval of the candidate's adviser.

II. Professional Studies—four to ten (4-10) semester hours of work, including Research Paper or the Thesis, to be selected from the following:

Grad	516	Statistical Methods I	.....	2 s.h.
LRes	500	Seminar in Learning Resources	.....	2 s.h.
Grad	550	Thesis	.....	2-4 s.h.
Psy	531	Psychology of the Exceptional Child	.....	2 s.h.
Psy	532	Studies in Pupil Adjustment	.....	2 s.h.

III. Foundations of Education—two (2) semester hours of work to be selected from the following courses:

Ed	511	Historical Foundations of Education	.....	2 s.h.
Ed	512	Philosophical Foundations of Education	.....	2 s.h.
Ed	513	Social Foundations of Education	.....	2 s.h.

IV. Research Techniques—the following course is required. It should be scheduled early in the student's program:

Grad	515	Elements of Research	2 s.h.
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In certain courses in the science department, additional laboratory time may be required beyond the regularly scheduled periods. Students who select a four-credit sequence are required to complete the sequence.

Sci 572 Experimental Techniques in Chemistry and Physics 2 s.h.

Emphasis will be placed on scholarly experience in experimentation, observation, and application of scientific concepts. Classroom and lecture demonstrations will be prepared, presented, and evaluated by students and instructor. Special attention will be given to the development of new ideas and new ways of presenting scientific principles. Prerequisites: Chemistry I, II, Physics I, II. (Bordas)

Sci 573-574 Computations in Physics and Chemistry 4 s.h.

This course is designed to help the teacher of physics and chemistry, who has a limited background in mathematics, to become more skillful in the solution of problems usually encountered in physics and chemistry courses. It should also provide him with a more adequate background to deal with the problems in his courses in the graduate program. (Mathematics Staff)

Bio 568 Biology Practicum 2 s.h.

This course is designed to convey to the high school biology teacher the knowledge of the preparation of culture media and solutions. Problems and techniques unique to the biological sciences with respect to demonstration material, handling and housing of plants and animals, safety in the laboratory and in the field, and the maintenance of equipment will be discussed. Theoretical and practical work will be done with the development of on-going experiments and research projects. Handbooks and other resource materials useful in the "laboratory approach" to biology will be given special attention.

SCIENCE FOR THE ELEMENTARY SCHOOL TEACHER

Francis W. Liegey, Chairman
(Robert N. Moore, Director)

Edwin W. Bailey
Joseph J. Costa
Gary M. Ferrence
Walter H. Granata, Jr.
William I. Heard
Donald E. Hoffmaster
Leon J. Hue
Jack Kuhns

Robert N. Moore
Frederick R. Park
Paul Prince
Fred Schrock
Martin L. Stapleton
Richard F. Wachter
Robert L. Woodard
Patsy A. Zitelli

The program leading to a Master of Education Degree in Elementary Science is designed to give elementary teachers depth and competency in the content areas of the physical and biological sciences. The assemblage of courses cited below should prepare the student for work as an Elementary Science resource person within his school or school district. Except for Bio 524 all of these courses are not open to majors in Biology, Chemistry, or Physics.

Following admission to the graduate school, each candidate is expected to appear before the Elementary Science Committee. At this meeting the candidate will be assigned to an advisor who will assist the student in planning the program of study deemed most appropriate for his professional growth. This advisor may also assist the student in selecting, preparing, and presenting his thesis or research project.

Curriculum for Master of Education Degree

This program is not intended for certification in science at the secondary level. It is designed to provide the elementary teacher with an opportunity to increase his ability to teach science at the elementary level. Students working for this degree with a major in Elementary Science will complete the thirty (30) semester hours of work in accordance with the following divisions:

I. Subject Matter Concentration Area—fourteen to twenty-two (14-22) semester hours of work in subject matter content are to be selected from the following courses, except that a more advanced course may be required by the adviser if the background of the student warrants. It should be noted that in some courses in Elementary Science additional laboratory time may be required beyond the regularly scheduled periods.

ElSc	510	Education in the Out-of-doors	2 s.h.
ElSc	511	Education in the Out-of-doors	2 s.h.
ElSc	530	Quantitative Tools for Elementary Science	2 s.h.
ElSc	540	Chemistry I	2 s.h.
ElSc	541	Chemistry II	2 s.h.
ElSc	550	Physics I	2 s.h.
ElSc	551	Physics II	2 s.h.
ElSc	560	Botany I	2 s.h.
ElSc	561	Botany II	2 s.h.
ElSc	564	Zoology I	2 s.h.
ElSc	565	Zoology II	2 s.h.
ElSc	566	Conservation	2 s.h.
ElSc	568	Field Biology I	2 s.h.
ElSc	569	Field Biology II	2 s.h.
ElSc	570	Geology	2 s.h.
ElSc	574	Meteorology	2 s.h.
ElSc	580	Astronomy	2 s.h.
Math	521	Basic Concepts in Mathematics	2 s.h.

ElSc	588	Field Natural History of Western Pa.	2 s.h.
Bio	524	Independent Studies	2-6 s.h.

II. Professional Studies—four to ten (4-10) semester hours of work including research paper or the thesis to be selected from the following:

Grad	516	Statistical Methods I	2 s.h.
LRes	500	Seminar in Learning Resources	2 s.h.
Grad	550	Thesis	2-4 s.h.
El	531	Curriculum Problems in Elementary Education	2 s.h.
El	533	Reading Disabilities of Elementary School Children	2 s.h.
El	542	Arithmetic in Elementary School	2 s.h.
El	543	Resource Materials in Elementary Science	2 s.h.
El	544	Recent Trends in Elementary Language Arts ..	2 s.h.
El	551	Recent Innovations in Elementary Education ..	2 s.h.
El	553	Supervision and Improvement of Instruction in the Elementary School	2 s.h.
El	555	Advanced Human Development and Learning	2 s.h.
Psy	531	Psychology of the Exceptional Child	2 s.h.
Psy	532	Studies in Pupil Adjustment	2 s.h.
ElSc	592	Elementary Science Curriculum	2 s.h.

III. Foundations of Education—two (2) semester hours of work to be selected from the following courses:

Ed	511	Historical Foundations in Education	2 s.h.
Ed	512	Philosophical Foundations in Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

IV. Research Techniques—the following course is required. It should be scheduled early in the student's program:

Grad	515	Elements of Research	2 s.h.
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Course Descriptions

ElSc 510, 511 Education in the Out-of-doors 4 s.h.
A course specifically designed to teach the elementary teacher to coordinate all of the elementary subjects into lessons taught in the out-of-doors that cannot ordinarily be taught in the classroom. Four (4) hours of laboratory. (Summers only) (Waechter, Kuhns)

ElSc 530 Quantitative Tools for Elementary Science 2 s.h.
The course is designed to help the elementary teacher become acquainted with and gain proficiency in the quantitative aspects of science. The emphasis will be on practical problem solving related to typical laboratory data. Considerable time will be spent on instruments, instrument calibration, graphing, and graph interpretation (interpolation and extrapolation). The area under the curve idea and the meaning of slope on a graph will be explored extensively. Concentrated instruction in the use of the slide rule, use of logarithms and algebra, trigonometric functions, scientific notation and significant figures will be used as tools to achieve the above objectives. (Bailey)

ElSc 540, 541 Chemistry I, II 4 s.h.
These courses are designed to help the elementary teacher become acquainted with chemistry as it is today. They approach the study of chemistry through investigation. Unifying principles of chemistry will be developed placing emphasis on experimentation. No previous college chemistry is necessary as a prerequisite. They are laboratory-centered courses. It is planned that experiences be provided to furnish data for a background in which principles and topics are discussed. The methodology employed provides experiences that elementary

teachers will find helpful in teaching science in the grades. Three (3) hours of lecture and/or laboratory per week for each course. It is necessary to complete Chemistry I before scheduling Chemistry II. (Heard, Costa)

EISc 550, 551 Physics I, II 4 s.h.

These courses are designed to increase the elementary teacher's knowledge and understanding of the concepts, methods, and experimental techniques of physics as a background for the teaching of that part of science in the elementary school. It is not the purpose of these courses to list what physics should be taught in the elementary grades nor how to teach it. The period will be devoted to lecture, class discussion and/or laboratory work. Physics I should be completed before Physics II is undertaken. (Zitelli)

EISc 560 Botany in Elementary Science Education I 2 s.h.

A laboratory course involving a study of flowering plants. Plant structure and processes will be studied. Utilizing plants of the immediate environment consideration will be given to the economic importance of plant and plant ecology. (Schrock)

EISc 561 Botany in Elementary Science Education II 2 s.h.

This laboratory course is devoted to a study of non-flowering plants. The life histories of a limited number of representative plants will be studied and the physiology, ecology and economic importance of the various lower plant groups will be considered. (Schrock)

EISc 564 Zoology in Elementary Science Education I 2 s.h.

A laboratory and field study course that begins with a survey of zoological taxonomy and proceeds with the study of representative invertebrate taxa. Emphasis is placed upon forms which may be observed or collected in the field during fall and early winter. (Stapleton)

EISc 565 Zoology in Elementary Science Education II 2 s.h.

A laboratory and field course which stresses the natural history of vertebrate forms and their ecological relationships. General embryological and genetic principles are considered. Homologous structures are compared and their functions studied. Principles of animal behavior are introduced. (Stapleton)

EISc 566 Conservation 2 s.h.

A course specifically designed to acquaint the elementary teachers with good and poor conservation practices. Field trips will be the core of the course, and free use will be made of federal and state conservation agencies. Taught in pre- and post-session only. (Hoffmaster)

EISc 568, 569 Field Biology I, II 4 s.h.

A laboratory course that will acquaint the elementary teacher with the biological environment outside of the classroom and will also provide a number of activities that are applicable to the elementary school. Four (4) hours of laboratory. (summers only) (Waechter)

EISc 570 Geology 2 s.h.

This course is designed specifically for those students enrolled in the elementary science program. One semester of descriptive geology is assumed as a geology background. Other students should acquire the consent of the instructor. The course includes a study of rocks and geologic formations as they are related to elementary science. Past history of the earth, as well as present day geologic phenomena are discussed. Field trips and laboratory work are part of the course. Two (2) hours of lecture and/or laboratory. (Park)

ElSc 574 Meteorology**2 s.h.**

The fundamentals of weather and weather instruments are discussed. Familiarization with weather instruments, maps, and records, as well as activities applicable to elementary science are underscored throughout the course. Two (2) hours of lecture and/or laboratory. (Prince)

ElSc 580 Astronomy**2 s.h.**

A descriptive and qualitative study of stellar and solar system Astronomy. The topics include telescopes and space travel at a level adaptable to the elementary school classroom, and involve techniques for their presentation. Two (2) hours lecture and/or laboratory. (Woodard)

ElSc 588 Field Natural History of Western Pennsylvania**2 s.h.**

Bus and automobile travel throughout Western Pennsylvania will constitute the entire course. Places of interest in ecology, geology, conservation, and nature study will be visited. Offered in pre- or post-session only. Travel may require that the student be away from the campus for several days at a time. (Ferrence)

ElSc 592 Elementary Science Curriculum**2 s.h.**

This course naturally follows El 543 and is concerned with the various approaches to the teaching of science and the elementary bases for these approaches. The study of new curricula that are being used in the elementary schools and their psychological relationships are covered. Two (2) hours of class. (Waechter)

SOCIAL SCIENCE

Raymond L. Lee, Director

Mamie Anderzhon	Marvin Huff	James Payne
Donald Ballas	John K. Kadlubowski	Edward E. Platt
Patrick A. Carone	David S. Keene	Downey Raibourn
Charles D. Cashdollar	Rudolph Kraus	Willis Richard
Edward Chaszar	Gopal Kulkarni	J. Merle Rife
Steven Cord	John J. Lank	John R. Sahli
John Cross	Dale Landon	Walter Shea
Wayne Davis	Neil Lehman	Bert A. Smith
Ronald T. Ferguson	Isadore Lenglet	Wayne Smith
Daniel I. Fine	Myron Levenson	Dorothy C. Vogel
Ernest Fricke	Irwin Marcus	Albert J. Wahl
Alexander Garvin	Joseph Mastro	Donald A. Walker
Thomas Gault	Jane S. Mervine	Patricia Walker
Clyde C. Gelbach	Vincent Miller	Stephen B. Ware
Virginia Gerald	Edgar Moore	William Warren
Thomas Goodrich	Robert L. Morris	Charles Weber
Brooke Grant	Esko E. Newhill	David Winslow
Ronald C. Green	Anja Olin-Fahle	Maurice Zacur
Richard F. Heiges	James Oliver	
Harry Holt	Dorothy A. Palmer	

The Master of Education Degree with a major in Social Science is designed to give secondary teachers greater depth and competency in the subject matter and research techniques of the social sciences.

Each student admitted to the Graduate School will be assigned to an adviser in the Social Science Division. All courses must be approved by that adviser.

Students working for this degree will complete a minimum of thirty (30) semester hours of work in accordance with the following divisions:

I. Subject Matter Concentration (14-22 s.h.)

Courses must be elected in three of five Social Sciences (Economics, Geography, History, Political Science, Sociology-Anthropology) to a minimum of 12 s.h. Four semester hours may be elected in allied fields (English, Mathematics, Foreign Language).

Economics

Econ 501	Foundations of Modern Economics	2 s.h.
Econ 525	Money, Banking, and Monetary Policy	2 s.h.*
Econ 551	International Economics	2 s.h.
Econ 552	Comparative Economic Systems	2 s.h.
Econ 553	Contemporary Economic Issues	2 s.h.
Econ 554	Economics Seminar (Prerequisite)	2 s.h.
Econ 555	Industrial Relations	3 s.h.
Econ 556	History of Economic Thought	3 s.h.

Geography

See pp. 120-124 for course descriptions.

History

See pp. 131-132 for course descriptions.

Political Science

POLS 560-565 Political Systems:

560	Latin America	2 s.h.*
561	Africa	2 s.h.*
562	Asia	2 s.h.*
563	Middle East	2 s.h.*
564	Central and Eastern Europe	2 s.h.*
565	Atlantic Community	2 s.h.*

PolS	571	Foreign Policy Studies	2	s.h.
PolS	572	Comparative Political Studies	2	s.h.
PolS	573	Regional Political Studies	2	s.h.
PolS	574	Political Science Seminar	2	s.h.
		(Prerequisite)		
PolS	575	American Political Parties	2	s.h.*
PolS	576	Legislative Process	2	s.h.*
PolS	577	Metropolitan Problems	2	s.h.*
PolS	578	American Constitutional Law	2	s.h.*
PolS	579	Modern Political Thought	2	s.h.*
PolS	580	Public Opinion	2	s.h.*
PolS	581	The Presidency	2	s.h.*
PolS	583	Federal Administrative Policy	2	s.h.*
PolS	584	Judicial Process	2	s.h.*
PolS	585	Political Philosophy	2	s.h.*
PolS	590	Studies in Political Science	2	s.h.*
PolS	591	Studies in Political Science	2	s.h.*
PolS	599	Political Science Internship	1-6	s.h.

* May occasionally be offered for 3 s.h. credit.

Sociology-Anthropology

Soc	562	Deviant Behavior	2	s.h.
Soc	563	Intergroup Relations	2	s.h.
Soc	564	Sociology Seminar (Prerequisite)	2	s.h.
Soc	565	Adolescent in American Society	2	s.h.
Anth	591	Studies in Anthropology	2	s.h.
Anth	592	Comparative Cultures	2	s.h.
Anth	593	The Science of Culture	2	s.h.
Anth	594	Anthropology Seminar (Prerequisite)	2	s.h.
Anth	595	Pre-History	2	s.h.

Unclassified

SS	510	New Approaches in Social Science Instruction	2	s.h.
SS	514	Research Methodologies in the Social Science	2	s.h.
SS	521	Contemporary American Issues	2	s.h.
SS	561	Social Policy Studies	2	s.h.
SS	598-599	Contemporary Europe	2-6	s.h.

II. Professional Studies (6-12 s.h.)

EdPsych	573	Advanced Psychology of Adolescent Education	2	s.h.
EdPsych	578	Advanced Studies in Learning Problems ...	2	s.h.
EdPsych	506	Advanced Educational Psychology	2	s.h.
EdPsych	513	Sociological Foundations of Education	2	s.h.
		or		
EdPsych	512	Philosophical Foundations of Education	2	s.h.
		or		
EdPsych	511	Historical Foundations of Education	2	s.h.
SS	510	New Approaches in Social Science Instruction	2	s.h.

III. Research (4-6 s.h.) Students must program a methods course early in their graduate work. This is followed by a seminar in which all theses or projects are initiated.

a. Methods (2 s.h.)

SS	514	Research Methodologies in Social Science
		or

Grad	515	Elements of Research
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b. Seminar (2 s.h.)

c. Project or Thesis (0-2 s.h.)

MASTER OF ARTS IN SOCIAL SCIENCE

This degree is designed to prepare instructors of Junior College teaching. It emphasizes preparation in two of the seven Social Sciences (Criminology, Economics, History, Geography, Political Science, Psychology, Sociology-Anthropology) in a major-minor arrangement. Students program as interns in each of these fields in a course that stresses the organization, focus, teaching techniques and materials of the discipline in general education.

This program will be initiated in September, 1971. Full details will be available from the Director, Social Science Division, in September, 1970.

I. Subject Matter (20-22 s.h.)

1. Major Field (12-14 s.h.)
2. Minor Field (8-10 s.h.)

II. Professional Courses (4 s.h.)

1. Internship: Major Field (2 s.h.)
2. Internship: Minor Field (2 s.h.)

III. Research Requirement (4-6 s.h.)

1. Elements of Research or
Research Methodologies in Social Science (2 s.h.)
2. Seminar—Major Field (2 s.h.)
3. Project or Thesis (0-2 s.h.)

Economics

Econ 501 Functions of Modern Economics 2 s.h.

(Not open to students who have credits of C or better in undergraduate Econ 121-122 sequence—Principles of Economics I and II—or equivalent.) Exposition of the discipline of Economics designed for the student who is not already well grounded in the field. Modern "mixed" capitalism, the price and market systems, and alternatives; national accounts concepts; full employment theory; economic stability; monetary and fiscal practices; product and factor pricing; and the significance of market model analysis.

Econ 525 Money, Banking, and Monetary Policy 2 s.h.

An examination of monetary economics: the structure and function of monetary institutions, including the Federal Reserve System, the commercial banks, and financial intermediaries, the theory of a monetary economy, and monetary policy.

Econ 551 International Economics 2 s.h.

The nature of the world economy, international trade, international investment, current international institutions, and the foreign economic policy of the United States. Prerequisite: Econ 501, or credits of C or better in six (6) s.h. of Principles of Economics.

Econ 552 Comparative Economic Systems 2 s.h.

Basic economic issues in capitalism, socialism, communism, and fascism, and their relationships to political and social problems. Prerequisite: Econ 501, or credits of C or better in six (6) s.h. of Principles of Economics.

Econ 553 Contemporary Economic Issues 2 s.h.

Attention will be centered on problem areas of the domestic economy in this course. The primary focus in each semester will be determined by student-instructor interest. Prerequisite: Econ 501, or credits of C or better in six (6) s.h. of Principles of Economics.

Econ 554 Economics Seminar 2 s.h.

Area research in the discipline, considering various facets of a central problem. Prerequisite: Grad 515, and Econ 501, or credits of C or better in six (6) s.h. of Principles of Economics.

Econ 555 Industrial Relations 3 s.h.

A study of the problems involved in the relations between the workers and management in a dynamic industrial society, and the economic aspects of the solutions proposed or attempted by labor, management, and the government. May not be programmed by students with undergraduate credit for Industrial Relations. Prerequisite: Econ 501, or credits of C or better in six (6) s.h. of Principles of Economics.

Econ 556 History of Economic Thought 3 s.h.

A study of the contribution of economic progress of the more prominent early philosophers, through to the modern economists; examining the various major schools of economic thought (Mercantilists, Physiocrats, Classicists, Socialists, Marginalists, Institutionalists, Neo-Classicalists, Keynesians, Post-Keynesians) and the impact of their thinking upon the present-day American economy. (Not open to students who have completed Econ 347) Prerequisite: Econ 501, or credits of C or better in six (6) s.h. of Principles of Economics.

Political Science**PolS 560-565 Political Systems 2 s.h.**

An intensive, comparative study of the government and politics of a selected region. PolS 572 Comparative Political Studies should be taken first, if possible.

PolS 560 Latin America (Chaszar)

PolS 561 Africa (Carone)

PolS 562 Asia

PolS 563 Middle East

PolS 564 Central and Eastern Europe (Platt)

PolS 565 Atlantic Community

PolS 571 Foreign Policy Studies 2 s.h.

This course considers selected problems in international affairs. Emphasis is placed on those problems and conflicts which have evolved in the post-war era, particularly as they relate to the position of the United States in World affairs. Specific problems are approached both in terms of the countries involved and in terms of the existing balance in the world economic, ideological, and power structure. (Platt)

PolS 572 Comparative Political Studies 2 s.h.

A course that considers the theory, structure, politics, and problems of selected foreign governments. Specific political ideas and governmental institutions are also analyzed from the comparative point of view. Special emphasis is placed on comparing and contrasting ideas and institutions with those of the United States. (Morris)

PolS 573 Regional Political Studies 2 s.h.

Examines the structure and function of state, county, and municipal governments. It emphasizes the problems faced by government at these levels and seeks solutions to these problems. Pennsylvania governmental forms are stressed but are contrasted with those of other states. (Heiges)

PolS 574 Political Science Seminar 2 s.h.

Area research in the discipline, considering various facets of a central problem. Prerequisite: Grad 515 or SS 514. (Staff)

PolS 575 American Political Parties 2 s.h.

This course will trace historically the development of American Political Parties. Major emphasis will be placed on modern party developments since 1900. May not be programmed by students who have undergraduate credit in American Political Parties. (Smith)

PolS 576 The Legislative Process**2 s.h.**

A functional study of legislative bodies and the process of legislation, covering the organization of legislative assemblies, operation of the committee system procedures, bill drafting, aids, and controls over legislation. May not be programmed by students with undergraduate credit in Legislative process. (Lank)

PolS 577 Metropolitan Problems

Analyzes the multiplicity of problems facing our metropolitan areas. Contemporary developments such as urban renewal, the shrinking tax base, federal aid to cities, subsidized mass transit, municipal authorities, and political consolidation are examined. Pennsylvania municipalities are contrasted with those of other states. May not be programmed by students with undergraduate credit in Metropolitan Problems. (Green)

PolS 578 American Constitutional Law**2 s.h.**

A study of the development of constitutional law through leading Supreme Court decisions. Topics treated include the scope of federal powers, civil liberties and civil rights, the nature of judicial review, federal-state relations. Attention is given to the continuing controversy over the role of the Supreme Court in American Society. May not be programmed by students with undergraduate credit in Constitutional Law. (Keene)

PolS 579 Modern Political Thought**2 s.h.**

The development of political thought since the mid-16th century. (Rousseau) Classic Liberalism of the Philosophic Radicals. Conservative thought since Burke. The nature and origin of modern irrational ideologies such as fascism and national socialism. Socialist thought (Marxist and non-Marxist). Contemporary collectivist liberalism. May not be programmed by students with undergraduate credit in Modern Political Thought. (Fine)

PolS 580 Public Opinion**2 s.h.**

A study of the nature of public opinion within the political system. Attention is given to the formation of public opinion, expression, propaganda, mass media, and interest groups. May not be programmed by students with undergraduate credit in Public Opinion. (Green)

PolS 581 The Presidency**2 s.h.**

An examination of the Office of President with attention to constitutional foundations, evolution, structure powers, and functions. Evaluation of the changing natures of the office within the American political system is stressed. Some comparisons are made between presidential and parliamentary systems and between the offices of President and Governor. May not be programmed by students with undergraduate credit in the Presidency. (Lank)

PolS 583 Federal Administrative Policy**2 s.h.**

An intensive study of the role of federal agencies and their administrators in determining and developing public policy. Public administration in practice is emphasized by utilizing case studies. Previous course in Public Administration is desirable but not required. May not be programmed by students with undergraduate credit in Federal Administrative Policy. (Palmer)

PolS 584 Judicial Process**2 s.h.**

Explores the nature and limits of judicial power, the courts as policy-making bodies, the selection of judges, the decision process, the external forces impinging on the courts, and the role of the Supreme Court in its relationship with Congress, the Presidency, and federalism. Judicial biographies and case studies are included. May not be programmed by students with undergraduate credit in Judicial Process. (Keene)

PolS 585 Political Philosophy**2 s.h.**

The evolution of the Western political tradition of Constitutionalism from Plato and Aristotle to Locke and Montesquieu. The religious (Judeo-Christian) and rational (Craeco-Roman) foundations. Medieval theories of authority and representation in church and state. Early modern theories of the state and sovereignty (Bodin and Hobbes). Emphasis on analysis of writings of leading theorists. Concepts of law, natural rights, liberty and equality, and justice are treated in detail. May not be programmed by students with undergraduate credit in Political Philosophy. (Fine)

PolS 590 and 591 Studies in Political Science**2 s.h. each**

In depth study of a specific problem or topic not regularly treated in courses. Emphasis is on readings and writing papers assigned by instructor. (Staff)

PolS 599 Political Science Internship**1-6 s.h.**

Practical experience in government and politics. Students are individually assigned to a cooperating local or state government agency, political party, or interest group, or to a federal or international agency when arrangements can be made. Examples: Assemblyman, Congressman, Community Action Program, Borough Manager, Planning Commission, Public Defender, Party Committee, CIO-AFL. Student will report periodically to Professor in charge, and undertake reading assignments and write such reports and papers as the Professor may require. Course credit hours will be determined by Department Chairman and by Professor in charge. Course grade will be determined by the Professor. (Staff) Prerequisite: Must have approval of instructor and Political Science Department Chairman. Course is offered only when arrangements for internship can be made with cooperating agencies and is normally available only to full-time students or during summer sessions.

NOTE: SS 514 (page 179)—Mr. Green also occasionally teaches this course.

Sociology - Anthropology**Soc 562 Deviant Behavior****2 s.h.**

Crime as a social product. The social-individual analysis of criminal behavior, its treatment and prevention. Lectures, discussions, papers. Prerequisite: Principles of Sociology. (Newhill)

Soc 563 Intergroup Relations**2 s.h.**

Intergroup tensions and conflicts will be the subject of study with the major emphasis upon techniques of social action designed to reduce conflict. Prerequisite: Principles of Sociology. (Shea)

Soc 564 Sociology Seminar**2 s.h.**

Area research in the discipline, considering various facets of a central problem. Prerequisite: Grad 515. (Staff)

Soc 565 Adolescent in American Society**2 s.h.**

A study of the American Adolescent in his varieties is attempted in this course. Because literature and research concern themselves mainly with the alleged pathologies of the American Adolescent and the dysfunctions of contemporary culture and society it is the task of the lecturer to abstract, with the help of discussion, that elusive "American Adolescent" who may become a non-delinquent as well as a delinquent. In doing so one must also view the contemporary American society and culture in this objective vein.

Anth 591 Studies in Anthropology**2 s.h.**

A survey for graduate students of the evolution of man and culture, presenting the principal findings of physical and cultural anthropology. (Staff)

Anth 592 Comparative Cultures**2 s.h.**

A comparative study of selected examples of the world's cultures, from primitive hunters to modern industrial systems, as adaptations to their geographical and social habitats. (Staff)

Anth 593 The Science of Culture**2 s.h.**

An introduction to the major theories of cultural anthropology which are employed to account for the variety and structure of man's cultures. (Staff)

Anth 594 Anthropology Seminar**2 s.h.**

Area research in the discipline, considering various facets of a central problem. Prerequisite: Grad 515. (Staff)

Anth 595 Pre History**2 s.h.**

A survey of the evolution of man and culture in the Old and New World from the earliest fossil and cultural forms to the Archaic Civilizations. Prerequisite: Introduction to Anthropology. May not be programmed by students with undergraduate credit for Archaeology. (Staff)

Unclassified**SS 510 New Approaches in Social Science Instruction****2 s.h.**

Starting with the conclusions developed from recent research in the several social sciences, a study will be made of the curricular and instructional changes, which have been proposed to close the gap between what we now know about human behavior and what is generally taught in social science courses. (Mervine)

SS 514 Research Methodologies in the Social Science**2 s.h.**

Selection of a research topic, techniques of locating and using source materials, the evaluation of evidence, the organization of the tested data, and the exposition of the tested data according to approved forms. Methodologies of value to students of politics, economics, or sociology will receive attention, in addition to those techniques usually treated in historiography. (Wahl)

SS 521 Contemporary American Issues**2 s.h.**

This course will be conducted in seminar fashion, centering its attention on one or two major contemporary American issues. Open only to non-majors in the Social Sciences. (Lee)

SS 561 Social Policy Studies**2 s.h.**

Focusing on several key issues on the American social scene, the class will examine the genesis of each problem, the present conflict of values inherent in the problem, the alternative proposals for its solution and the social consequences. Open only to non-majors in the Social Sciences. (Newhill)

SS 598-599 Contemporary Europe**2-6 s.h.**

A study project devoted to the politics, economics, sociology, history and culture of Europe through direct observation. (Staff)

CONTEMPORARY EUROPE

The Social Science Division annually sponsors a study-tour of Europe during the Summer Session. This course, which carries 2-6 hours of graduate credit, emphasizes the economic, social, political, and military organization of the continent based on the historical development of the region. Interested students are invited to write to:

Contemporary Europe
Social Science Division
Indiana University of Pennsylvania
Indiana, Pennsylvania 15701

Course descriptions for all History courses may be found in this bulletin under the History section, those for Geography under the Geography section.

SPECIAL EDUCATION AND CLINICAL SERVICES

Morton Morris, Chairman

Nelson H. Bormann
 Maude O. Brungard
 Eugene A. Felix
 Marshall G. Flamm

Marion M. Geisel
 William H. Mackaness
 L. Leon Reid
 Eugene F. Scanlon

The graduate program offers specialization in two fields, with major curriculum concentrations available in Special Education (Mentally Retarded) or in Speech and Hearing. Each concentration area leads to the Master of Education degree. A graduate level of competency in these fields is in accord with national standards now emphasized by professional organizations such as the Council for Exceptional Children and the American Speech and Hearing Association.

Using the curriculum outlines provided below, students working for the Master's degree in Special Education (Mentally Retarded), or in Speech and Hearing, should select from fourteen to eighteen semester hours in their Subject Matter Concentration area (Group I). Student majors should also select from eight to twelve semester hours of course work in the area of Professional Studies and Electives (Group II). All degree candidates are required to select two semester hours in the area of Foundations of Education (Group III), and two semester hours in Grad 515, Elements of Research. The two semester hours in Elements of Research should be taken early in the student's program, for in this course plans for the thesis or research project may be started. However, it should not be scheduled at the very beginning of the program.

Admission to the Master's degree program assumes that certain subjects normally included in the undergraduate major have been successfully completed. In admission of majors in Special Education (Mentally Retarded), this would include basic undergraduate work in exceptionality, curriculum, educational psychology, mental hygiene, and human growth and development. A student with a deficiency may be admitted provisionally to the department with the understanding that deficiencies will be made up.

In admission of majors in Speech and Hearing, students must have completed at least eighteen (18) semester hours of certain subjects normally included in the undergraduate major. If a student lacks three (3) or more credits of prerequisites he may be provisionally admitted to the department and upon successful completion of the courses required to remove the deficiencies will be accepted to full graduate status.

SPECIAL EDUCATION AND CLINICAL SERVICES

Curriculum for the Master of Education Degree

I. Subject Matter Concentration

Two areas of Subject Matter Concentration are offered, each leading to the Master of Education Degree: (1) Special Education—Mentally Retarded; (2) Speech and Hearing

(1) SPECIAL EDUCATION — select fourteen to eighteen (14-18) semester hours

Psy	539	Psychology of the Mentally Retarded	2 s.h.
SpE	540	Diagnostic Techniques in Special Education	2 s.h.
SpE	520	Curriculum and Methods (Elementary)	2 s.h.
SpE	521	Curriculum and Occupational Education (Secondary)	2 s.h.
SpE	522	Orientation to Rehabilitation	2 s.h.

SpE	530	Organization and Administration of Programs for Exceptional Children	2 s.h.
SpE	535	Guidance and Adjustment	2 s.h.
SpE	541	Interpretation of Psychological Test	2 s.h.
SpE	545	Community and Agency Planning	2 s.h.
SpE	555	Practicum and Internship	2-4 s.h.
SpE	560	Selected Problems and Research	2 s.h.
SpE	565	Education of Children with Social and Emotional Maladjustments	2 s.h.

(2) SPEECH AND HEARING—select fourteen to eighteen (14-18) semester hours

A. Basic Area (select 2 s.h. of course work in this area)

SpH	550	Speech Science	2 s.h.
SpH	650	Experimental Phonetics	2 s.h.

B. Speech Concentration

SpH	510	Articulation	2 s.h.
SpH	512	Cleft Palate	2 s.h.
SpH	514	Cerebral Palsy	2 s.h.
SpH	532	Adult Aphasia	2 s.h.
SpH	530	Childhood Aphasia	2 s.h.
SpH	504	Diagnostic Methods	2 s.h.
SpH	516	Stuttering	2 s.h.
SpH	518	Voice	2 s.h.

C. Hearing (select 2 s.h. in this area)

SpH	540	Advanced Audiology	2 s.h.
SpH	640	Theories of Hearing	2 s.h.

D. Advanced Clinic Practicum (select 4-6 s.h. in this area; a minimum of 6 s.h. of graduate work are prerequisite)

SpH	561	Advanced Clinical Practicum I	2-3 s.h.
SpH	663	Advanced Clinical Practicum II	2-3 s.h.

II. Professional Studies and Electives—select eight to twelve semester hours (8-12 s.h.) according to major subject matter concentration.

Psy	531	Psychology of the Exceptional Child	2 s.h.
Ed	522	Principles and Practices in Speech Improvement	2 s.h.
Psy	538	Psychology of the Gifted Child	2 s.h.
Grad	516	Statistical Methods I	2 s.h.
Grad	517	Statistical Methods II	2 s.h.
Psy	530	Psychology of Growth and Development	2 s.h.
CnEd	533	Evaluation Methods in Guidance I	2 s.h.
CnEd	534	Evaluation Methods in Guidance II	2 s.h.
Psy	534	Abnormal Psychology	2 s.h.
Psy	535	Differential Psychology	2 s.h.
Psy	536	Psychology of Learning	2 s.h.
Psy	540	Advanced Mental Hygiene	2 s.h.
Psy	533	Psychology of Personality	2 s.h.
CnEd	531	Philosophy and Principles of Guidance	2 s.h.
Psy	532	Studies in Child Adjustment and Guidance	2 s.h.
Ed	534-535	Diagnosis and Remediation in Reading	2-4 s.h.
Grad	550	Thesis	2-4 s.h.

III. Foundation of Education—select two semester hours (2 s.h.)

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

IV. Research—two semester hours (2 s.h.) required.

Grad	515	Elements of Research	2 s.h.
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Course Descriptions**(1) SPECIAL EDUCATION (Mentally Retarded)****Psy 531 Psychology of the Exceptional Child 2 s.h.**

This course is designed to aid the student in meeting the needs of those children who deviate from the typical in areas of physical, mental, emotional, and educational developments. Consideration will be given to methods of instruction and curricular material. (Morris)

Psy 538 Psychology of the Gifted Child 2 s.h.

Characteristics of the bright, fast-learning child will be explored along with implications for education. Emphasis will also be given to measurement techniques, motivational factors, and personality dynamics.

Psy 539 Psychology of the Mentally Retarded 2 s.h.

Characteristics of the slow-learner and of the non-educable child will be explored along with implications for education. Emphasis will also be given to measurement techniques, motivational factors and personality dynamics.

SpE 520 Curriculum and Methods (Elementary) 2 s.h.

This is a basic course dealing with the design of curriculum content, selection of instructional materials, and procedures at elementary age levels. Curriculum development and selected activities designed for retarded pupils are analyzed according to sequence and relevance of content, and levels of social maturity among pupils. Representative curricula are evaluated according to specified criteria. (Prerequisite: Psy 531, Psy 539)

SpE 521 Curriculum and Occupational Education (Secondary) 2 s.h.

This course considers adjustments in regular organization and curriculum which are specifically designed for retarded youth of secondary school age. Emphasis is placed upon content and procedures for developing attitudes, knowledges, and skills among pupils, in preparation for post-school adjustments to suitable work situations and responsible adulthood. (Prerequisite: Psy 531, Psy 539)

SpE 522 Orientation to Rehabilitation 2 s.h.

Principles and practices in rehabilitation are introduced, with attention given to the contributions of teachers, counselors, nurses, social workers, psychologists, speech therapists, and other professional workers.

SpE 530 Organization and Administration of Programs for Exceptional Children 2 s.h.

Principles, practices, and problems of administration and supervision are considered as they relate to developing and maintaining special education programs. Criteria are analyzed for use in evaluation of local programs. The functions of administrators and supervisors in school systems are compared according to rural, urban, or state-wide responsibilities. (Prerequisite: SpE 520, 521, 540) (Required for administrators and supervisors)

SpE 535 Guidance and Adjustment 2 s.h.

Home, school, and community influences are analyzed in family adjustment to the presence of a retarded child. Family reactions are considered in behavioral differences among children with moderate and severe degrees of retardation. Emphasis is given to guidance skills and knowledges needed by teachers and other professional workers in the field of mental retardation.

SpE 540 Diagnostic Techniques in Special Education 2 s.h.
Diagnostic procedures and appropriate test materials are selected for use in assessment of pupils with mental and physical limitations. Observations and demonstrations are analyzed critically. Reporting and interpreting results of diagnostic procedures are integrated with remedial or developmental recommendations in individual case studies (Prerequisite: Psy 531, Psy 539)

SpE 541 Interpretation of Results of Psychological Tests 2 s.h.
Results of psychometric tests are analyzed and interpreted. Various standardized psychological instruments and test batteries are considered in the light of their purpose and usage. Both individual and group test results are examined critically.

SpE 545 Community and Agency Planning 2 s.h.
Selected professional, governmental and community organizations are studied for their contributions to comprehensive planning toward educational, personal-social, and occupational adjustments of the mentally retarded. Social, economic, and cultural aspects are analyzed.

SpE 555 Practicum and Internship 2-4 s.h.
Advanced students are offered guided practicum experiences in selected schools, residential institutions, clinics, or agencies. Internship or supervised student teaching is planned individually. Students analyze, evaluate, and report on their experiences.

SpE 560 Selected Problems and Research 2 s.h.
Major theories and practices in special education are evaluated. Students have an opportunity to review critically recent developments in the field. Opportunity is afforded for independent readings and limited research reports. A student may identify a topic for subsequent development as his thesis or research project. (Prerequisite: Psy 539, SpE 540)

SpE 565 Education of Children with Social and Emotional Maladjustments 2 s.h.

This course examines reactions of children in the schools who deviate in their emotional or social behavior. Consideration is given to children who habitually exhibit overcontrolled, undercontrolled, or immature reactions. Identification, characteristics, educational provisions, and preventive measures are emphasized.

(2) SPEECH AND HEARING

(Students working for the Master of Education Degree with a major in Speech and Hearing will complete a minimum of thirty (30) semester hours in the total program. In the area of subject matter concentration, fourteen, to eighteen (14-18) semester hours will be required, with at least two (2) semester hours in the basic area, two to four (2-4) semester hours in the hearing area and from four to six (4-6) in clinical practicum. At least six (6) semester hours of graduate work are prerequisite to enrollment in practicum courses.)

A. Basic Area

SpH 550 Speech Science 2 s.h.
A physiological, neurological, and acoustical study of the communicative process with special attention to speech monitoring, controls and perception. Emphasis will be placed on current research methodology, clinical instrumentation, and laboratory techniques.

SpH 650 Experimental Phonetics 2 s.h.
An application of laboratory and research techniques in phonetics; development of palatograms; experience in use of the polygraph; kymograph, pneumagraph and other electronic equipment; analysis of the recordings and their significance in diagnosis and therapy.

B. Speech Concentration**SpH 510 Articulation****2 s.h.**

Advanced study of speech production with major emphasis on the articulatory mechanism and its functioning in relationship to the total speech process; recognized etiologies, diagnoses, and symptomatologies of articulatory disorders. Various methods of treatment, their rationale, appropriate use and adaptation to group or individuals. Critical review of selected topics of research.

SpH 512 Cleft Palate**2 s.h.**

A study of the embryology of the facial and cranial skull with emphasis on the development of the oral pharyngeal structures associated with speech; theories of etiology, classifications of lip and palatal clefts; methods of surgical and prosthetic repair with consideration to the appropriateness and feasibility of a specific procedure; principles and methods of speech and language training.

SpH 514 Cerebral Palsy**2 s.h.**

The neuropathology of the central nervous system as associated with types of cerebral palsy; the basis for sensory-motor and perceptual disabilities and speech and hearing handicaps; the emotional, intellectual, physical and psychological problems of the cerebral palsied individual and the means and methods of his habilitation with emphasis on the role played by the speech and hearing therapist in this habilitation.

SpH 532 Adult Aphasia**2 s.h.**

Consideration of trauma and of cerebro-vascular accident in relation to aphasia and brain function, methods of diagnosis and evaluation of the sensory and motor skills with emphasis on the communication function; the impact of speech and language loss on personality; and principles and techniques of speech and language relearning with attention to the influence of psychological and physiological factors on the relearning process.

SpH 530 Childhood Aphasia**2 s.h.**

Review of factors in differential diagnosis, characteristics, and capacities of aphasic children and means of assessing them; principles and techniques of teaching including the Association Method; approaches to helping parents understand the problems of the aphasic child.

SpH 504 Diagnostic Methods**2 s.h.**

A compilation and evaluation of diagnostic resources applicable to evaluation of speech disorders bases for selection of appropriate materials in differential diagnoses; interpretation of test results and their significance in planning future therapy.

SpH 516 Stuttering**2 s.h.**

An intensive study of the nature of the stuttering disorder and its effects in the dynamics of personality development, evaluation of prevalent causal theories and their implications for both symptomological and psychological methods of treatment as adapted to individuals or group situations. Review of pertinent and recent research topics.

SpH 518 Voice**2 s.h.**

An advanced study of the theory of voice production with emphasis on physiology, pathology and malfunctioning which produce voice defects; the possible relationship of disorders of voice and disorders of personality; diagnostic methods and therapeutic considerations for both organic and psychogenic disorders. Special attention will be given to therapy for the laryngectomized.

C. Hearing

SpH 540 Advanced Audiology 2 s.h.
The identification of types of hearing loss by special audiological tests—speech audiometry, Bekesy, SAL, tone decay, PGSR; interpretation of the audiogram and its relevancy to diagnosis and remedial procedures; functions and characteristics of hearing aids with respect to speech reception and discrimination.

SpH 640 Theories of Hearing 2 s.h.
An intensive review of the neurophysiology of the auditory system; the cochlea as a sound analyzer; pathways from cochlea to cerebral cortex; experimental studies on the auditory systems of animals and electrical potentials of nerve action.

D. Advanced Clinical Practicum

SpH 561 Advanced Clinic Practicum I 2-3 s.h.
Supervised clinical practice with children and/or adults exhibiting functional or organic speech and hearing problems of varying degrees of severity; diagnosis of problems and acceptance of responsibility for planning complete programs of habilitation, stressing the speech and language area. Interviewing, counseling and report writing will be included. Two clock hours per credit.

SpH 663 Advanced Clinic Practicum II 2-3 s.h.
Students will be expected to assume full responsibility for interviewing, diagnosing, counseling, planning a program of either individual or group therapy and implementing it for persons exhibiting either functional or organic speech or hearing problems of a moderately severe nature. Reports will be required, but actual supervision should be held to a minimum. Two clock hours per semester hour.

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